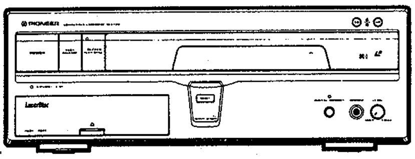
PIONEER®
The Art of Entertainment

Service Manual



ORDER NO.
ARP2757

CD CDV LD PLAYER

CLD-A100

CLD - A100 HAS THE FOLLOWING:

Type	Power Requirement	Remarks
KU	AC 120 V only	

- **This manual is applicable to CLD - A100/KU.**

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1. SAFETY INFORMATION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING
Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).
When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

NOTICE
(FOR CANADIAN MODEL ONLY)
Fuse symbols (fast operating fuse) and/or (slow operating fuse) on PCB indicate that replacement parts must be of identical designation.

REMARQUE
(POUR MODÈLE CANADIEN SEULEMENT)
Les symboles de fusible (fusible de type rapide) et/ou (fusible de type lent) sur CCI indiquent que les pièces de remplacement doivent avoir la même désignation.

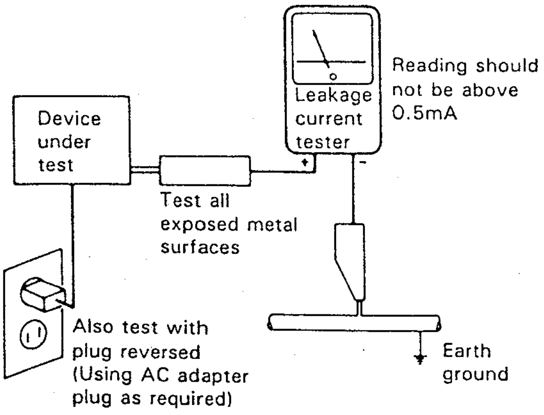
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.


Reading should not be above 0.5mA
Leakage current tester
Device under test
Test all exposed metal surfaces
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.
The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

2. DISASSEMBLY

• Removing the Tray Unit

1. Remove the two fixing screws Ⓩ (Fig. 2-1).
2. Press the LD STOP OPEN/CLOSE button to set the tray unit to its OPEN position.

* When manually setting the tray unit to its OPEN position, refer to Notes 1 and 2.

3. Pull out the tray unit while pressing the hook Ⓐ (Fig. 2-1), located on the rear right side of the tray unit, to the left.

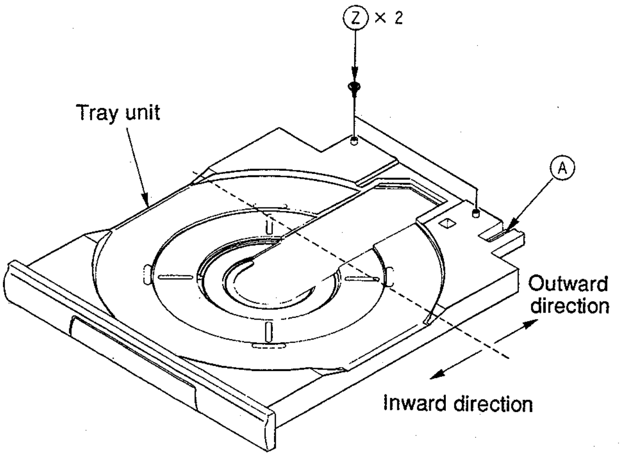


Fig. 2-1

Note 1. Manually setting the tray unit to its OPEN position

1. Remove the clamper holder unit Ⓑ (Fig. 2−2) by loosening its four screws.

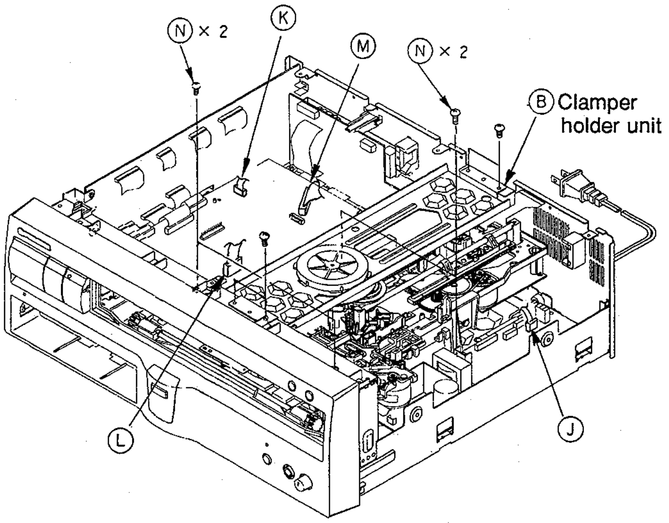


Fig. 2-2

2. Make sure that the position of the lens in the pickup assembly is such that the lens stops outside the position indicated by the dotted line in Fig. 2-1.

   When the lens stops inside the dotted line, slowly press the Ⓠ portion of the rack assembly (Fig. 2-3) to move the lens in the pickup assembly until the lens is outside the position indicated by the dotted line in Fig. 2-1.

   Note that by not going through this process, opening the CD tray and removeing the tray unit would be more time-consuming.

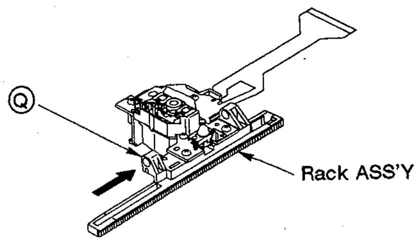


Fig. 2-3

3. Insert your hand through the right side of the tray unit and turn the gear pulley Ⓒ (Fig. 2-4) in a clockwise direction until the servo-mechanism unit Ⓓ (Fig 2-5) lowers. Keep turning the pulley until the tray unit starts to move towards the front.

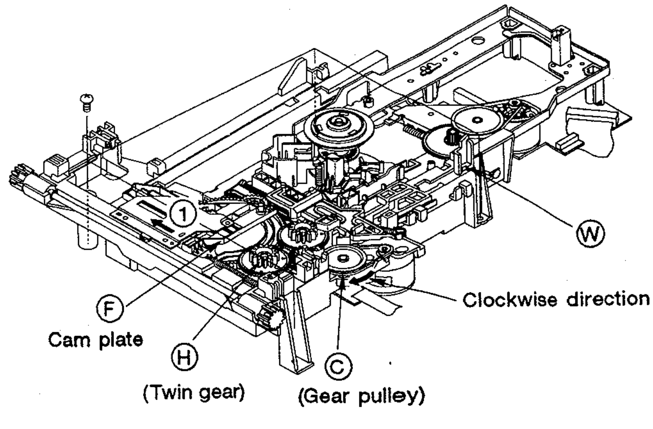


Fig. 2-4

4. Slowly pull out the tray unit to the OPEN position.

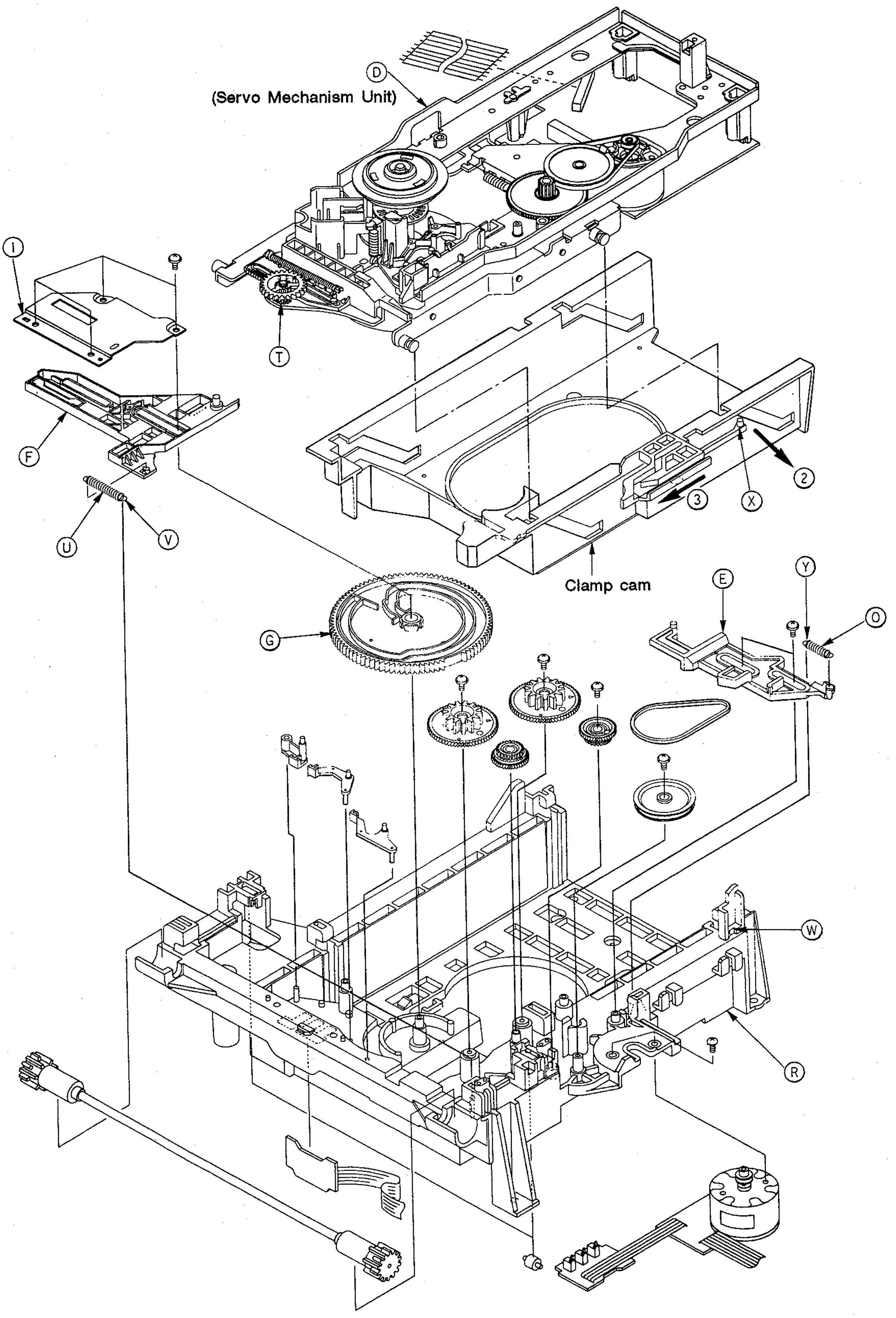

D
(Servo Mechanism Unit)
I
T
F
U
V
2
3
X
Clamp cam
E
Y
O
G
W
R

Fig. 2-5

Note 2. Setting the tray unit to its OPEN position when the CD tray is completely or partially OPEN

1. Remove the clamper holder unit Ⓑ (Fig. 2-2) by loosening its four screws.
2. Slowly push in the CD tray to the CLOSE position.
3. Slowly press the Ⓠ portion of the rack assembly (Fig. 2-3) to move the lens in the pickup assembly until the lens is outside the position indicated by the dotted line in Fig. 2-1.
4. Insert your hand through the right side of the tray unit and turn the gear pulley Ⓒ (Fig. 2-4) in a counterclockwise direction until the servo−mechanism unit Ⓓ (Fig. 2-5) starts to move upward. Keep turning the pulley until the clamp position is reached (the LD tray and CD tray become one unit).
5. When the clamp position has been reached, turn the gear pulley Ⓒ (Fig. 2-4) in a clockwise direction until the servo-mechanism unit Ⓓ lowers. Keep turning the pulley until the tray unit starts to move towards the front.
6. Slowly pull out the tray unit to the OPEN position.

• Attaching the Tray Unit

1. Make sure that the CD plate Ⓔ is positioned to the left (LD tray mode) as in Fig. 2-6. When the CD plate Ⓔ is positioned to the right (CD tray mode) as in Fig. 2-6, perform steps 1) to 2).

    1) Turn the power ON. After pickup assembly stopped, push cam plate Ⓕ (Fig. 2-6) towards the direction of the arrow Ⓘ.

    2) Wait until the cam gear Ⓖ (Fig. 2-6) turns, the servo-mechanism unit Ⓓ (Fig. 2-5) goes upward, and the pickup assembly stops moving.

2. Press the LD STOP OPEN/CLOSE button to open the tray unit, or pull out the power cord from the AC outlet and turn the twin gear Ⓗ (Fig. 2-4) in a counterclockwise direction until the cam gear Ⓖ (Fig. 2-6) can no longer turn.
3. Keeping the tray unit parallel with the front panel, slowly insert the tray unit through the opening of the front panel.

Note that if you insert the tray unit in the front panel when the tray unit and the front panel are not parallel with each other, the tray unit might get stuck while being inserted.

• Removing the Servo-Mechanism Unit

1. Remove the clamper holder unit Ⓑ (Fig. 2-2) by loosening its four screws, and remove the tray unit.
2. Remove the four connectors Ⓙ to Ⓜ (Fig. 2-2).
3. Remove the four fixing screws Ⓝ of the mechanism base and remove the whole servo-mechanism unit from its casing.
4. Remove the Ⓨ side of the CDP spring Ⓞ (Fig. 2-5) as well as the CD plate Ⓔ by loosening the CD plate's two screws.
5. Remove the lead wire from the lead wire hook Ⓢ (Fig. 2-7) for the spindle motor at the rear of the mechanism base Ⓡ.

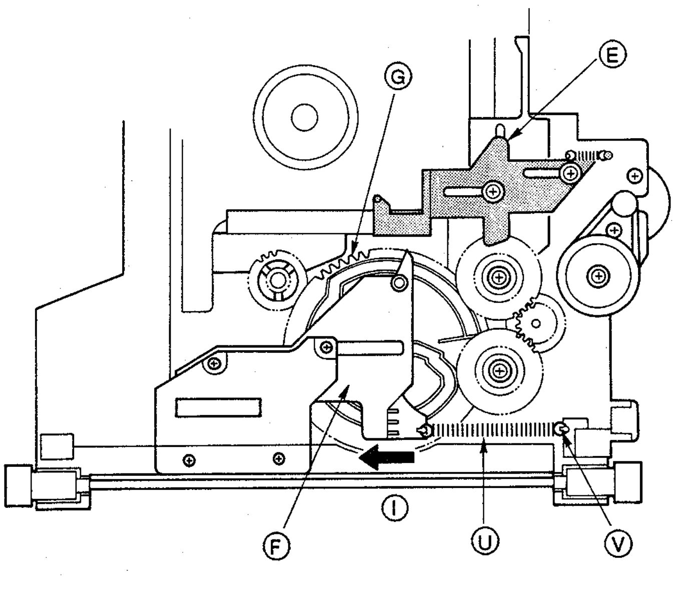


Fig. 2-6

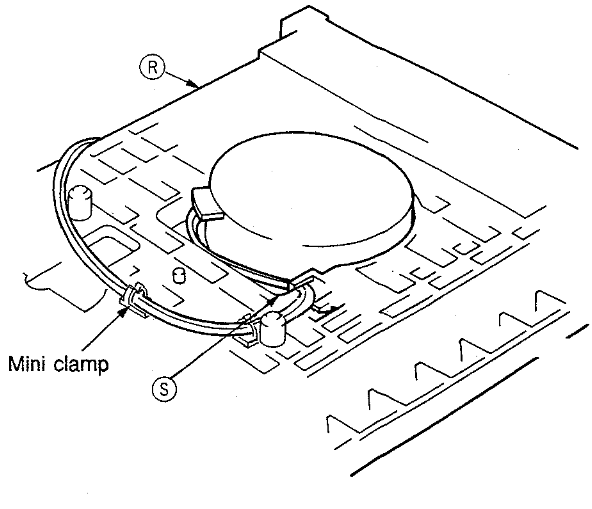


Fig. 2-7

6. While pushing the cam plate Ⓕ (Fig. 2-4) towards the direction of the arrow ①, turn the twin gear Ⓗ (Fig. 2-4) in a clockwise direction.
7. Stop turning the twin gear Ⓗ (Fig. 2-4) when the servo-mechanism unit Ⓓ (Fig. 2-5) has gone upward and the Y-gear Ⓣ is engaged with the cam gear Ⓖ by three to five teeth.
8. While bending the clamp cam hook Ⓧ (Fig. 2-5) in the direction of the arrow ②, move the hook to its "built-in position" Ⓦ (Fig. 2-4) towards the rear.
9. Lift the servo-mechanism unit Ⓓ straight up and remove the unit from the clamp cam (Fig. 2-5).

- **Attaching the Servo-Mechanism Unit**

1. Return the clamp cam and other parts to their original positions (when the servo-mechanism unit was removed).
2. While turning the Y-gear Ⓣ in a clockwise direction by three to five teeth (Fig. 2-8) in the same manner as when the Y-gear was removed, attach the servo-mechanism unit from above to the clamp cam (Fig. 2-5).
3. While bending the clamp cam hook Ⓧ in the direction of the arrow ②, move the hook in the direction of the arrow ③ (Fig. 2-5).
4. While the servo-mechanism unit is raised, hook the lead wire from the spindle motor to hook Ⓢ (Fig. 2-7) on the rear of the mechanism base Ⓡ.
5. Turn the twin gear Ⓗ (Fig. 2-4) in a counterclockwise direction until the servo-mechanism unit lowers, the cam gear Ⓖ (Fig. 2-5) stops turning, and the twin gear Ⓗ (Fig. 2-4) runs idle.

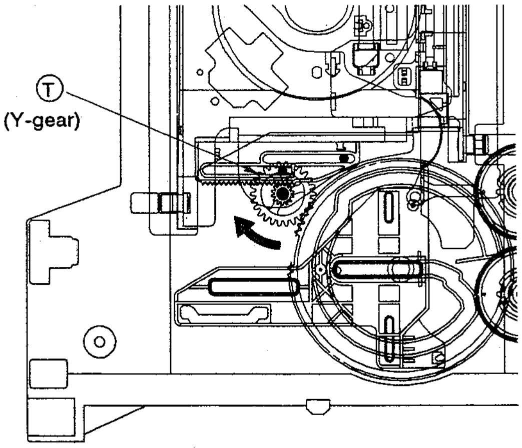


Fig. 2-8

- **Attaching the Cam Gear and Cam Plate**

1. Bring the clamp cam (Fig. 2-5) close towards you (while the servo-mechanism unit is being lowered).
2. Insert the cam gear Ⓖ upon directing the rib horizontally as shown in Fig. 2-9.

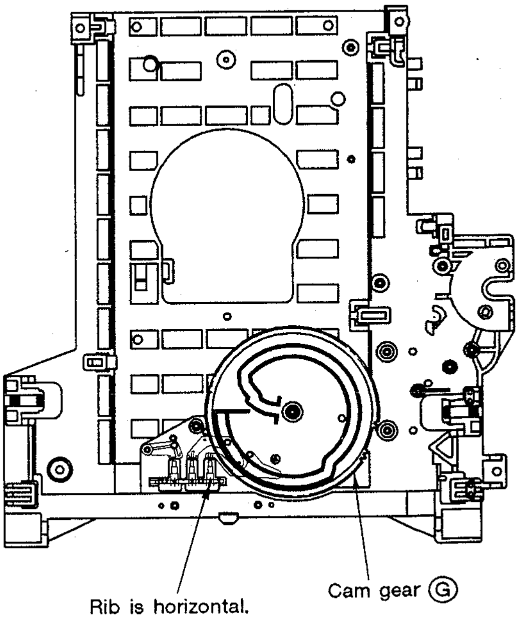


Fig. 2-9

3. Attach the CAS spring, Ⓤ (Fig. 2-6) to the cam plate Ⓕ, and hook the Ⓥ side of the CAS spring to the spring-latching part of the mechanism base.

4. Slightly turn the cam gear Ⓖ in a counterclockwise direction until the cam gear reaches the position shown in Fig. 2-10.

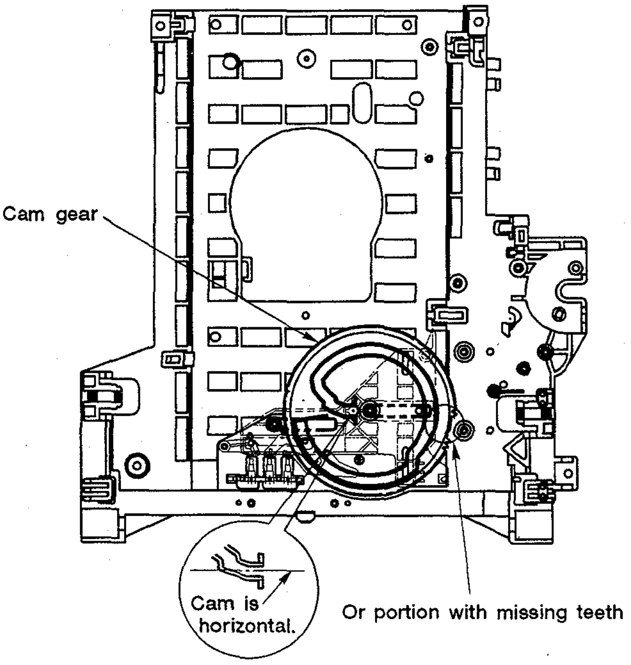

Cam gear
Cam is horizontal.
Or portion with missing teeth

Fig. 2-10

5. Attach the cam plate Ⓕ on the cam gear Ⓖ when the plate has moved to the rightmost position (Fig. 2-6).
6. Fix the shaft holder Ⓘ using four screws (Fig. 2-5).

• Matching the Position of the Gears

1. Attach the center gear Ⓟ , twin gears (H1) and (H2), and Y-gear Ⓣ in the positions indicated in Fig. 2-11.

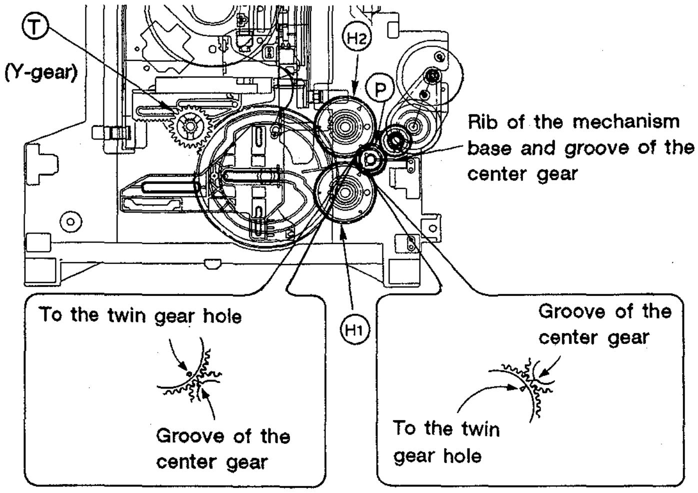

Ⓣ
(Y-gear)
(H2)
Ⓟ
Rib of the mechanism base and groove of the center gear
To the twin gear hole
Groove of the center gear
(H1)
Groove of the center gear
To the twin gear hole

Fig. 2-11

• Attaching the CD Plate

1. Upon attaching the CD spring Ⓞ (Fig. 2-5) to the CD plate Ⓔ , hook the Ⓨ side of the CD spring to the mechanism base hook.
2. Attach the CD plate Ⓔ (from the left side) into the position shown in Fig. 2-6.

3. EXPLODED VIEWS AND PARTS LIST

NOTES:
- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by " ◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

3.1 EXTERIOR, DISC TRAY AND FRONT PANEL

Part List

Mark	No.	Description	Parts No.
	1	Bonnet−S	DXX2120
	2	Screw	BCZ40P060FZK
	3	Screw	BBZ30P080FMC
	4	....	
	5	Power button	DNK2725
	6	Release button	DNK2726
	7	Play button ass'y	DXA1624
	8	Panel spring	DBH1226
	9	Name plate	VAM1032
	10	IR panel	DNK2724
NSP	11	STBB ass'y	DWG1361
NSP	12	PLYB ass'y	DWG1360
	13	Reset button	DNK2728
	14	Eject button	DNK2730
	15	Through button	DNK2729
	16	Volume knob	DNK2731
	17	Snap plate	VNE1102
	18	Jack holder	VNE1811
NSP	19	HEPB ass'y	DWG1363
NSP	20	CLDB ass'y	DWG1362
NSP	21	MAIN ass'y	DWG1359
	22	Screw	BPZ26P060FMC
	23	Guide plate (R)	VNE1806
	24	Guide plate (L)	VNE1805
	25	CD tray	VNK1992
	26	Lock plate spring	VBH1188
	27	Lock plate	VNL1513
NSP	28	LD tray	VNK1991
	29	Disc pad (L)	VEC1191
	30	Disc pad (C)	VEC1380
NSP	31	Carry label	VRW1289
	32	Screw	IPZ20P050FMC
	33	Carry cushon	VEC1578
	34	Door spring	DBH1227
	35	Door shaft	VLL1441
NSP	36	CD Door	DNK2733
	37	Door holder	VNE1812
	38	LD door	DNK2732
	39	Screw	VBA1032
NSP	40	Front panel ass'y	DXA1623
	41	Front panel ass'y−S	DXX2119
	42	CD door ass'y−S	DXX2109
	43	Tray ass'y−S	VXX1729
	44	....	
	45	Damp cushon	VEC1110
	46	Stop ring	VEB1091
NSP	47	Cushion	VEC1618
	48	Screw	VBA1034
	49	Screw	BPZ30P060FCU
	50	Screw	BPZ30P080FCU
NSP	51	65 label	ORW1069

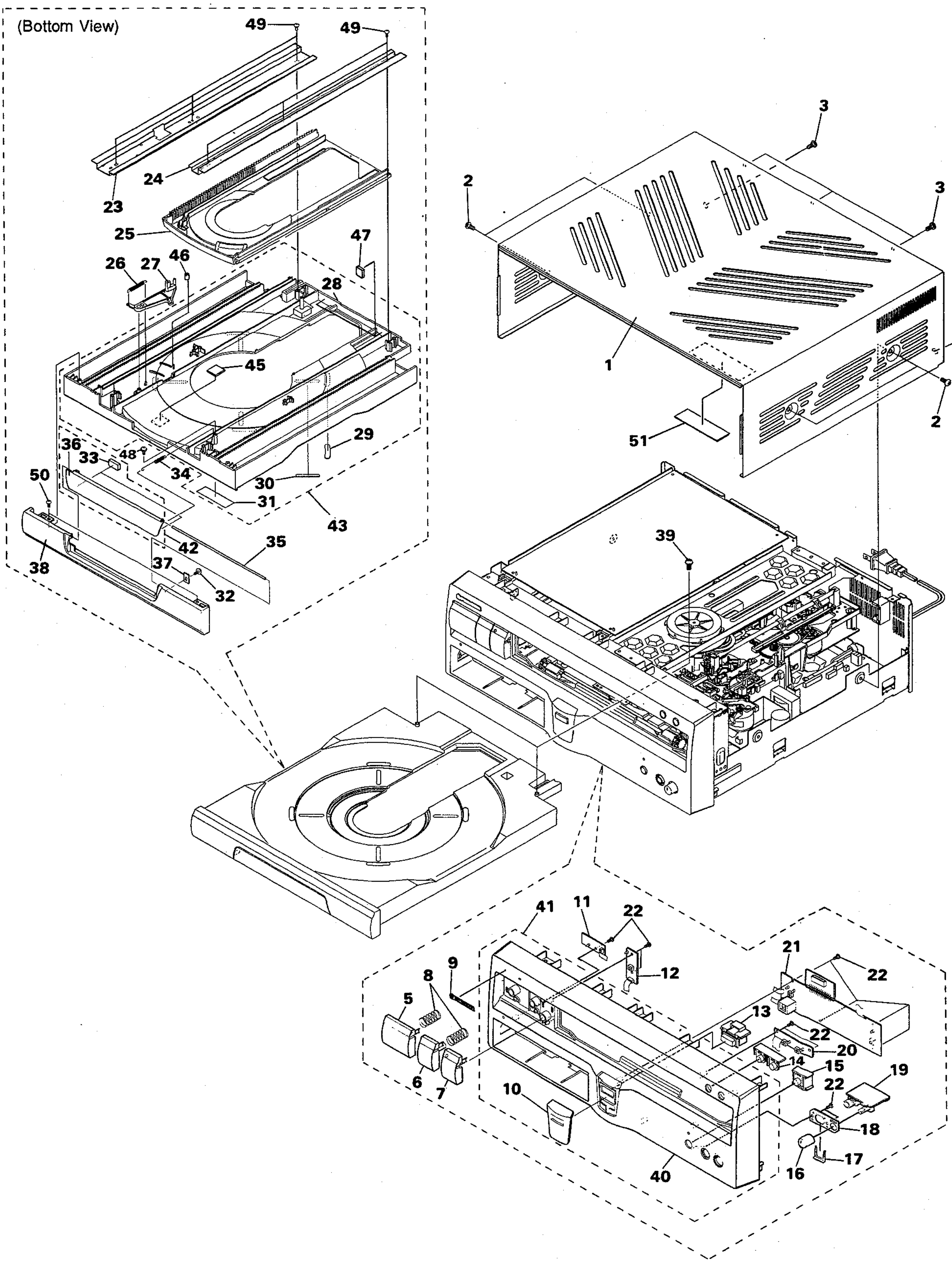
NOTE : Screws adjacent to ▼ mark on product are used for disassembly.

A

B

C

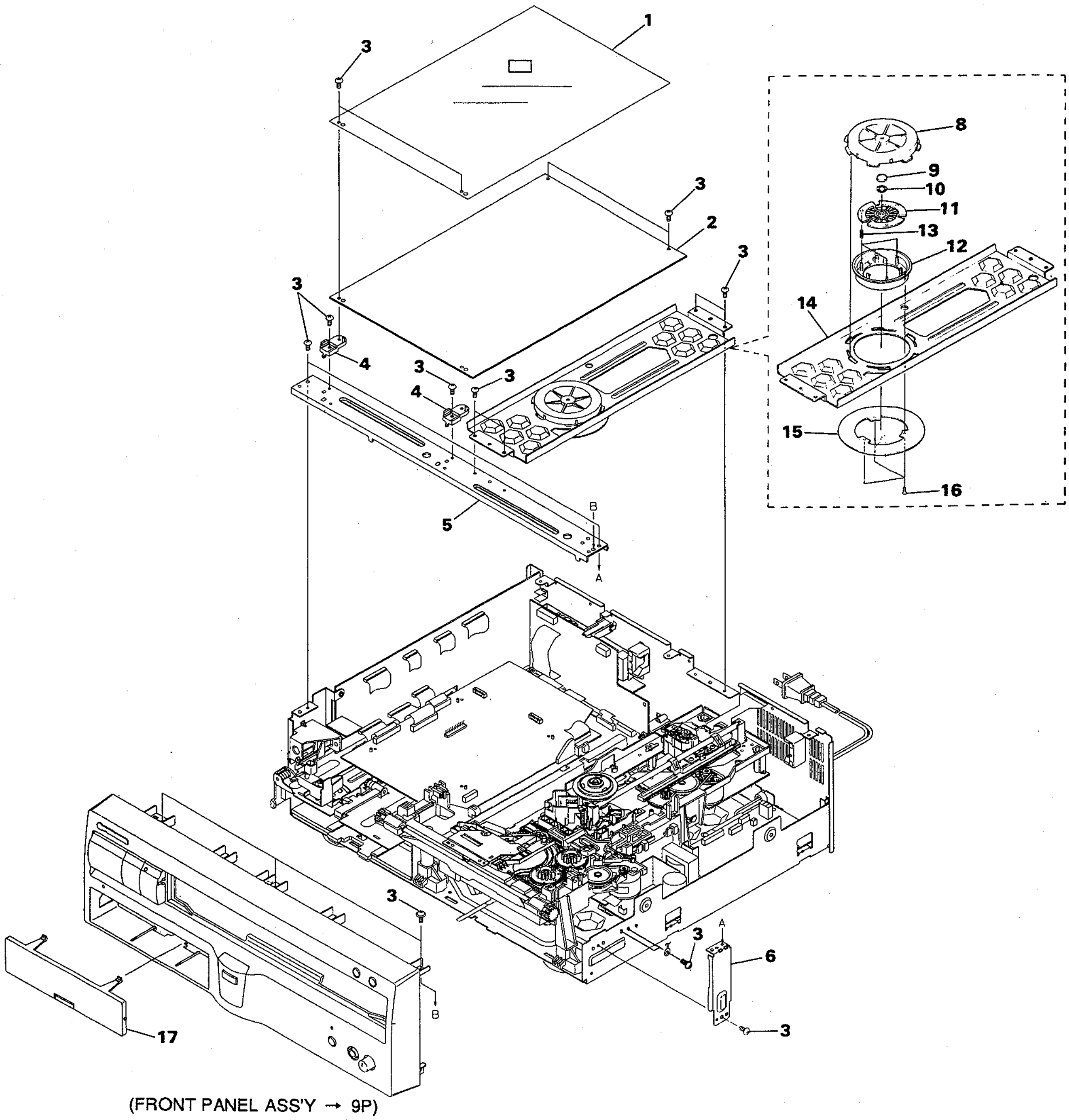
D


(Bottom View)

3.2 TOP VIEW AND CLAMPER ASSY

Part List

Mark	No.	Description	Parts No.
	1	Sheet L	DEC1732
	2	VIDEO ass'y	DWV1132
	3	Screw	BBZ30P080FMC
	4	Base S	DNK2742
	5	Front stay	DNE1207
	6	Side stay R	DNE1209
	7	············	
	8	Clamper holder	VNL1514
	9	Rubber sheet	VEB1114
	10	Ball holder	VNL1289
	11	Clamper head	VNL1516
	12	Clamper	VNL1515
	13	Clamper spring	VBH1192
	14	Clamper arm	VNE1804
	15	Stabilizer	VNE1807
	16	Screw	CPZ20P050FMC
	17	Pack port	DNK2743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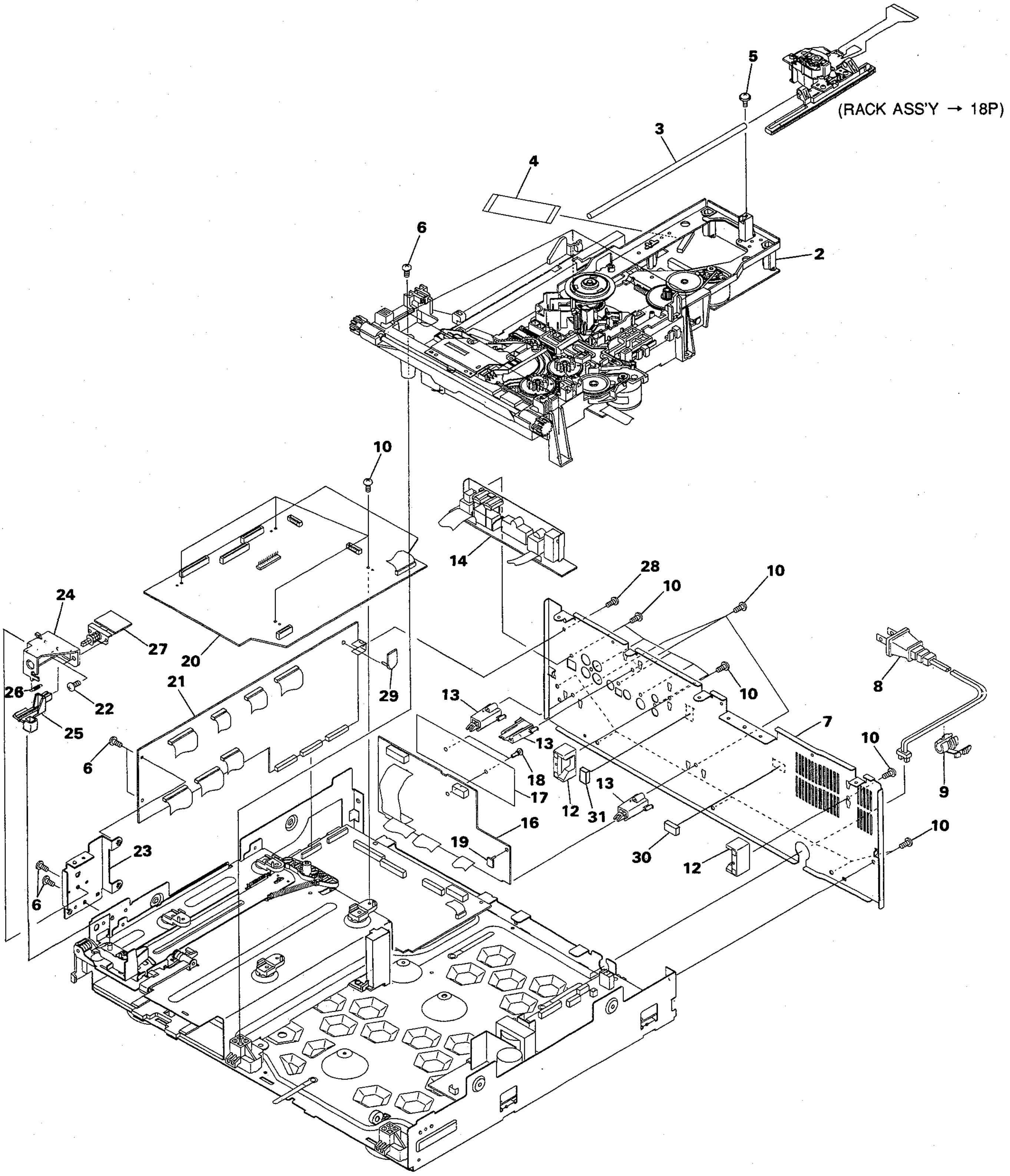
17

(FRONT PANEL ASS'Y → 9P)

3.3 BOTTOM VIEW

Part List

Mark	No.	Description	Parts No.
	1	············	
NSP	2	Mech. ass'y	DWT1090
	3	Carriage shaft	VLL1434
	4	Flexible cable	DDD1074
	5	Screw	IPZ30P060FMC
	6	Screw	BBZ30P080FMC
	7	Rear panel	DNA1135
⚠	8	AC power cord	DDG1060
⚠	9	AC cord stopper	CM−22C
	10	Screw	BBZ30P080FMC
	11	············	
	12	Tray stopper	VNL1519
	13	PCB stay	DNK2764
NSP	14	JACB ass'y	DWX1349
	15	············	
	16	RGBB ass'y	DWM1346
	17	Sheet S	DEC1699
	18	Nylon rivet (3×4.5)	RBM−003
	19	Mini clamp	DEC1715
	20	FTSB ass'y	DWS1191
	21	CONT ass'y	DWG1367
	22	Screw	PMB30P060FMC
	23	Side stay (L)	DNE1208
	24	PW holder	DNK2740
	25	PW lever	DNK2741
	26	PW spring	DBH1234
NSP	27	PWSW ass'y	DWG1368
	28	Screw	BCZ30P060FMC
NSP	29	PCB holder	VNL1221
NSP	30	Support cushion	VEC1601
NSP	31	Adjust cushion	DEC1734


(RACK ASS'Y → 18P)
A
B
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D
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21
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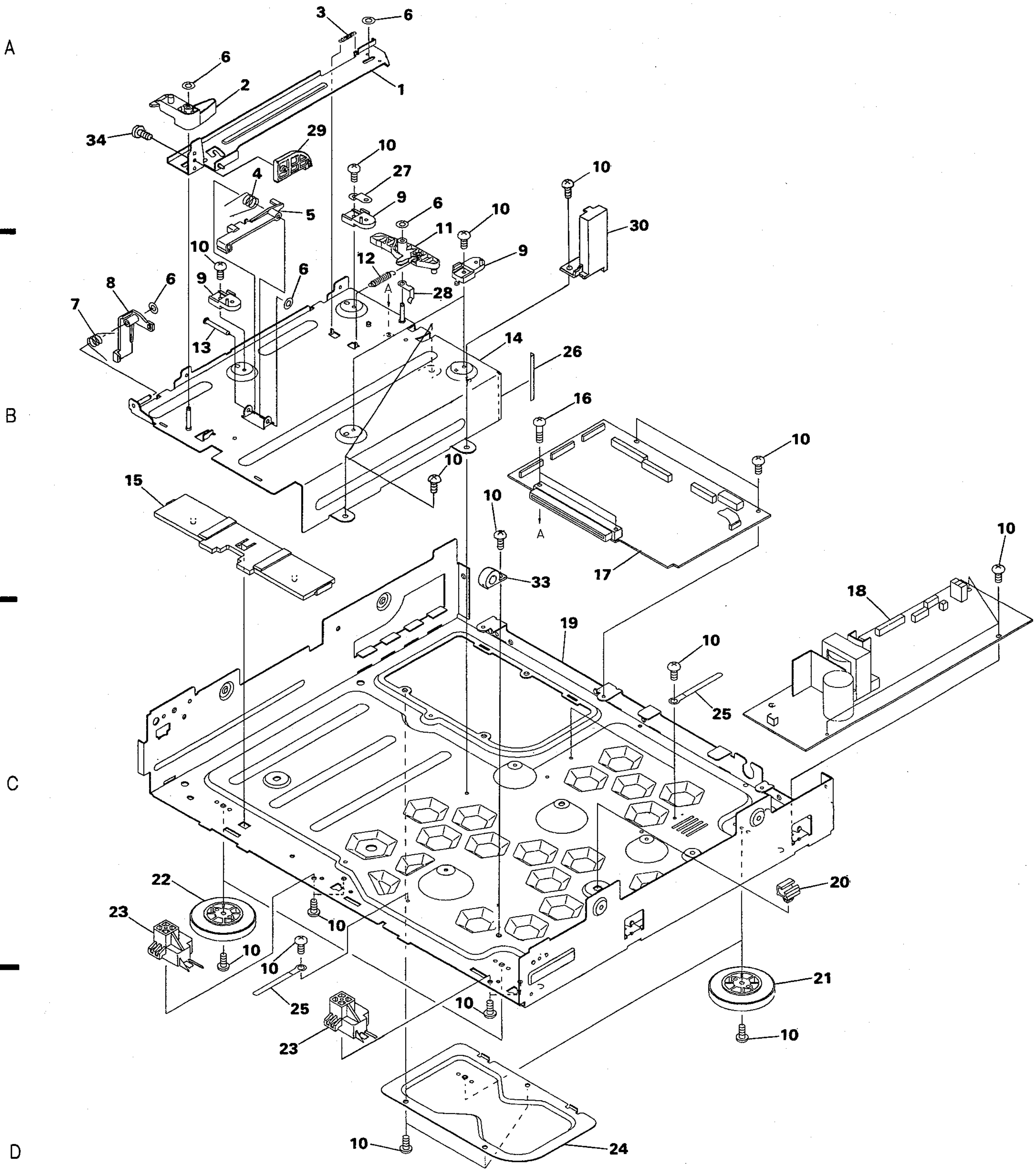
6

3.4 PACK INSERT SECTION

Part List

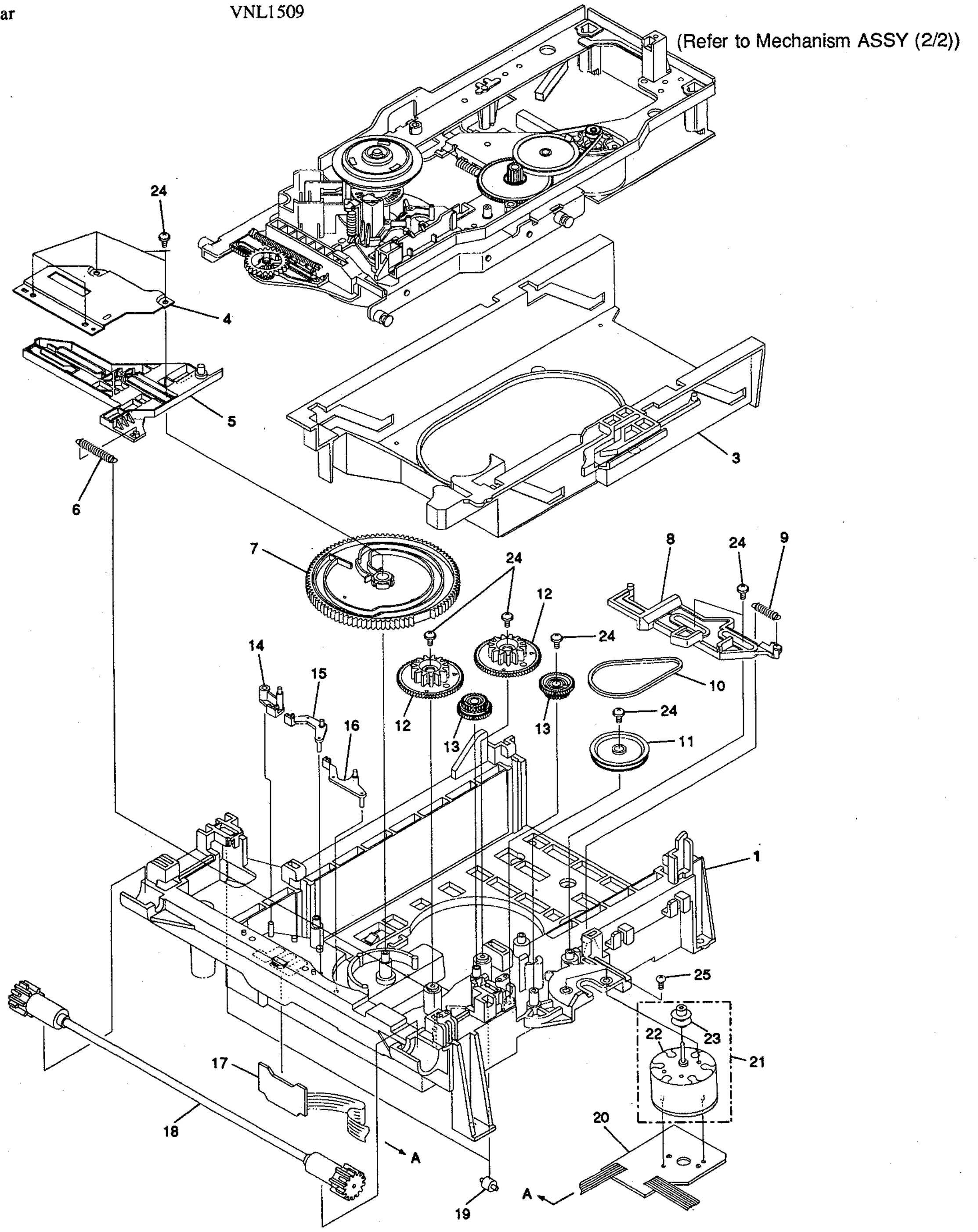
Mark	No.	Description	Parts No.
	1	Slide plate ass'y	DXA1627
	2	Select lever	DNK2738
	3	Slide spring	DBH1229
	4	Lock lever spring	DBH1230
	5	Lock lever	DNK2737
	6	Washer	WT26D070D050
	7	Pack lever spring	DBH1231
	8	Pack lever	DNK2739
	9	Base S	DNK2742
	10	Screw	BBZ30P080FMC
	11	Eject lever	DNK2736
	12	Eject lever spring	DBH1228
	13	Lock lever shaft	DLL1011
	14	Shield case ass'y	DXA1626
	15	Pack base	DNK2735
	16	Screw	PMZ26P100FMC
	17	INTF ass'y	DWM1341
	18	SYPS ass'y	DWR1156
NSP	19	Chassis	DNA1125
NSP	20	P plate holder	PNY−405
	21	Insulator ass'y	DXA1491
	22	Insulator ass'y	VXA1881
	23	Mech stay	DNK2765
	24	Under panel	DNE1204
NSP	25	Cord holder	Z09−061
	26	Seal A	DEC1363
	27	Earth angle	DNE1213
NSP	28	Earth plate	DNE1234
	29	Slide guide	DNK2838
	30	Core holder	DNK2841
	31	············	
	32	············	
	33	Ring core	DTH1161
	34	Screw	BPZ26P060FMC


A
B
C
D
A
A

3.5 MECHANISM ASSY (1/2)

Part List

Mark	No.	Description	Parts No.
	1	Mechanism base	VNK1990
	2	....	
	3	Clamp cam	VNL1500
	4	Shaft holder	VNE1817
	5	Cam plate	VNL1511
	6	CAS Spring	VBH1190
	7	Cam gear	VNL1507
	8	CD plate	VNL1512
	9	CDP spring	VBH1191
	10	Rubber belt	VEB1184
	11	Gear pulley	VNL1510
	12	Twin gear	VNL1508
	13	Center gear	VNL1509
	14	L−SW lever	VNL1504
	15	C−SW lever	VNL1505
	16	R−SW lever	VNL1506
NSP	17	LOSB ass'y	DWG1357
	18	Synchro gear ass'y	VXA1822
	19	Roller	VNL1042
NSP	20	LOMB ass'y	DWG1358
	21	Loading motor ass'y	VXX1712
NSP	22	Slider motor	VXM1033
	23	Motor pulley	PNW1643
	24	Screw	Z39−019
	25	Screw	BMZ26P040FMC

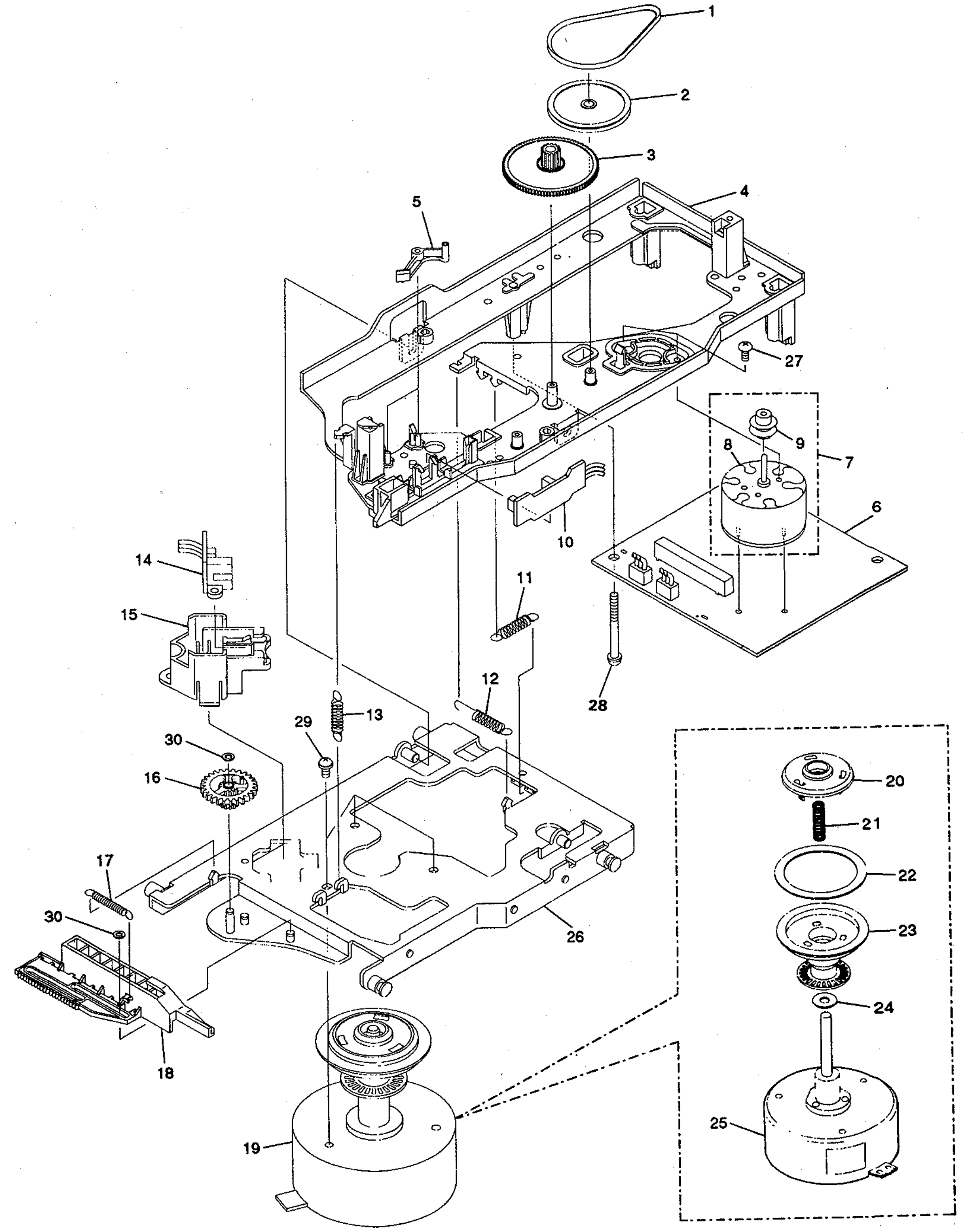


(Refer to Mechanism ASSY (2/2))

3.6 MECHANISM ASSY (2/2)

Part List

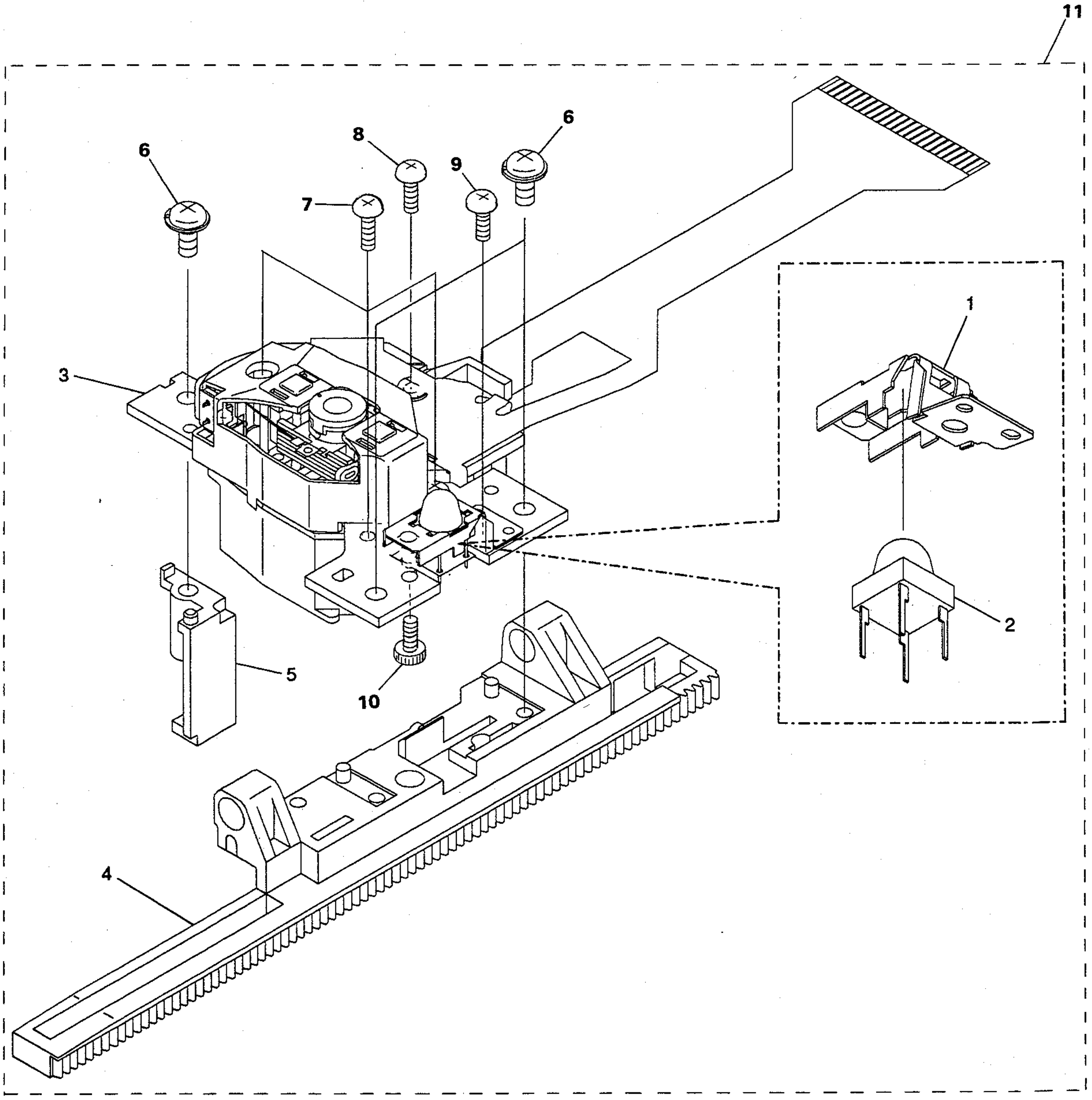
Mark	No.	Description	Parts No.
	1	CA belt	VEB1077
	2	CA pulley (2)	VNL1496
	3	CA gear (3)	VNL1497
	4	Tilt base	VNL1499
	5	CA−SW lever	VNL1498
NSP	6	CAMB ass'y	DWG1356
	7	CRG motor ass'y	VXX1261
NSP	8	Slider motor	VXM1033
	9	CA pulley (1)	VNL1197
NSP	10	PKSB ass'y	DWG1355
	11	Radial spring	VBH1201
	12	Thrust spring	VBH1200
	13	Tilt tension	VBH1187
NSP	14	FG ass'y	DWG1354
	15	FG base	VNL1503
	16	Y gear	VNL1501
	17	Tilt cam spring	VBH1189
	18	Tilt cam	VNL1502
	19	Spindle motor ass'y	DXA1639
	20	Centering hub	VNL1174
	21	Centering spring	VBH1083
NSP	22	Rubber sheet	VEB1103
NSP	23	Turn table ass'y	VXA1283
NSP	24	Oil stopper	VBF1002
NSP	25	Spindle motor	VXM1055
	26	Motor base	VNE1803
	27	Screw	BMZ26P040FMC
	28	Screw	ABZ30P300FMC
	29	Screw	PMA30P050FMC
	30	Washer	WT26D060D025



3.7 RACK ASSY

Part List

Mark	No.	Description	Parts No.
NSP	1	Sensor stay	VBK1036
NSP	2	Tilt sensor	SG−302
NSP	3	Pick up ass'y	VWY1030
	4	Rack	VNL1495
	5	TAN base	VNL1494
	6	Screw	PBB26P080FMC
	7	Screw	PMA20P060FMC
	8	Screw	PMA20P080FMC
	9	Screw	PMH20P040FMC
	10	Screw	SMZ20H120FZK
	11	Rack ass'y	VWT1103



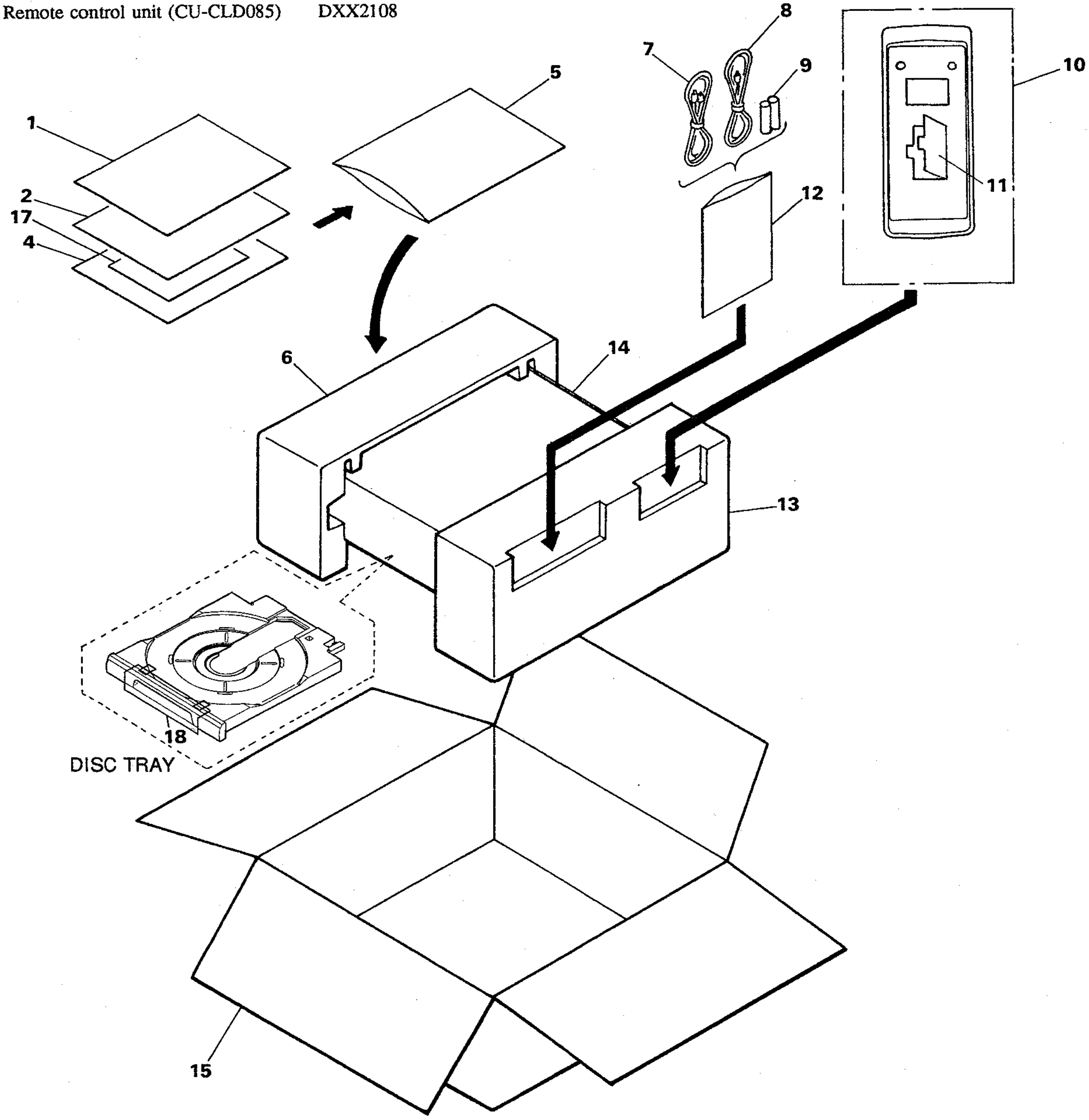
4. PACKING AND PARTS LIST

NOTES:

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by " ◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

Part List

Mark	No.	Description	Parts No.
	1	Operating instructions (English)	DRB1141
NSP	2	Caution (UC)	VRM1026
	3	············	
NSP	4	Caution	VRR1009
NSP	5	Polyethelene bag	VHL−014
	6	Pad (F)	DHA1236
	7	Connection cord	VDE−055
	8	Video cable	VDE−056
NSP	9	Battery(AAA, R03)	VEM−022
	10	Remote control unit (CU-CLD085)	DXX2108
	11	Battery cover	DNK2766
NSP	12	Polyethelene bag	Z21−029
	13	Pad (R)	DHA1237
	14	Mirror mat	VHL1012
	15	Packing case	DHG1512
	16	············	
NSP	17	Warranty card	ARY1044
	18	Mirror mat sheet	DHL1082



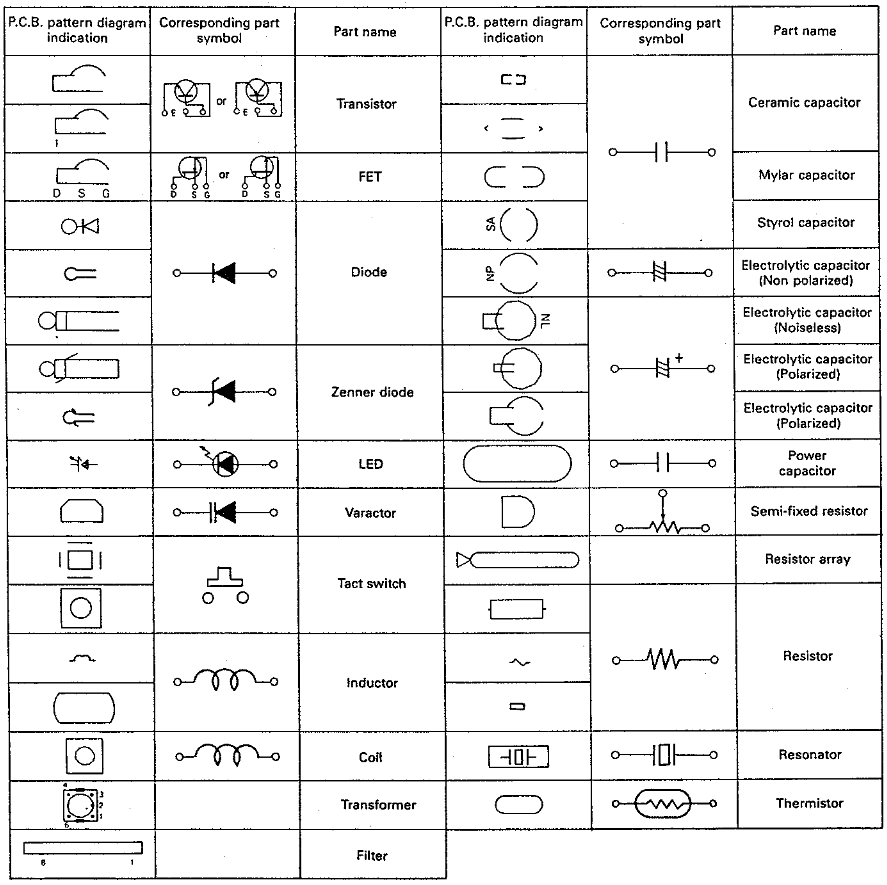
5. SCHEMATIC AND PCB CONNECTION DIAGRAMS

NOTE FOR SCHEMATIC DIAGRAMS (Type 4A)

1. **When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".**
2. **Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.**
3. **RESISTORS:**
   Unit: k:kΩ, M:MΩ, or Ω unless otherwise noted.
   Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
   Tolerance: (F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% or ±5% unless otherwise noted.
4. **CAPACITORS:**
   Unit: p:pF or µF unless otherwise noted.
   Ratings: capacitor (µF)/ voltage (V) unless otherwise noted.
   Rated voltage: 50V except for electrolytic capacitors.
5. **COILS:**
   Unit: m:mH or µH unless otherwise noted.
6. **VOLTAGE AND CURRENT:**
   ▭ or ← V :
   DC voltage (V) in PLAY mode unless otherwise noted.
   ⇦ mA or ← mA :
   DC current in PLAY mode unless otherwise noted.
   Value in ( ) is DC current in STOP mode.
7. **OTHERS:**
   - ⊘ or ➊ : Adjusting point.
   - ◄ : Measurement point.
   - The ⚠ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.
8. **SCH–□ ON THE SCHEMATIC DIAGRAM:**
   - SCH–□ indicates the drawing number of the schematic diagram. (SCH stands for schematic diagram.)
9. **SWITCHES** (Underline indicates switch position):

MAIN ASSY
S101 : DIGITAL MEMORY
S102 : RESET
PLYB ASSY
S201 : PLAY
CLDB ASSY
S401 : CD EJECT
S402 : LD EJECT
PWSW ASSY
S101 : POWER ON–OFF
PKSB ASSY
S4 : PARK IN
S5 : PARK OUT
LOSB ASSY
S1 : SW1
S2 : SW2
S3 : SW3

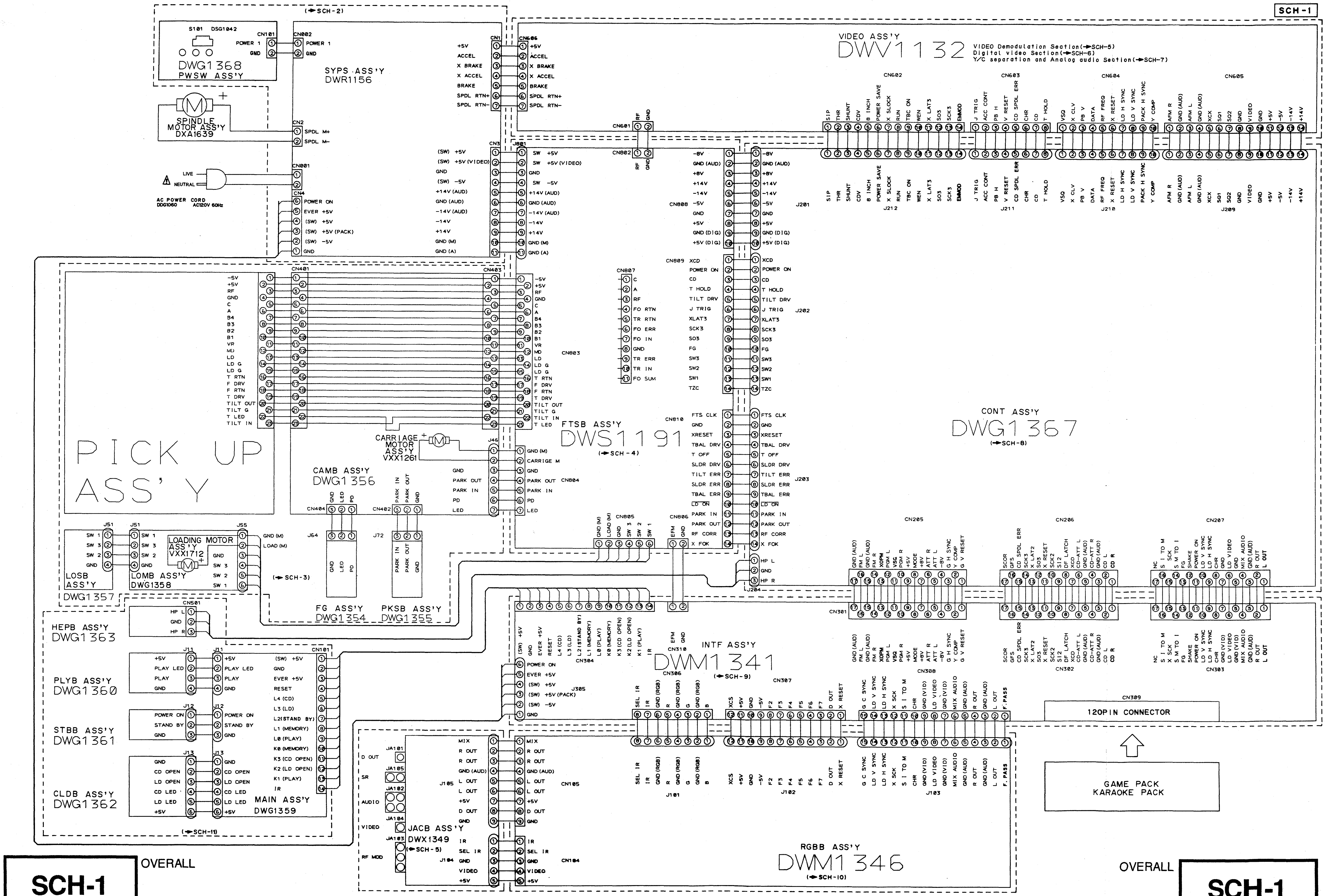
NOTE FOR PCB CONNECTION DIAGRAMS



P.C.B. pattern diagram indication	Corresponding part symbol	Part name	P.C.B. pattern diagram indication	Corresponding part symbol	Part name
		Transistor			Ceramic capacitor
		FET			Mylar capacitor
		Diode			Styrol capacitor
					Electrolytic capacitor (Non polarized)
					Electrolytic capacitor (Noiseless)
		Zenner diode			Electrolytic capacitor (Polarized)
					Electrolytic capacitor (Polarized)
		LED			Power capacitor
		Varactor			Semi-fixed resistor
		Tact switch			Resistor array
					Resistor
		Inductor			
		Coil			Resonator
		Transformer			Thermistor
		Filter			

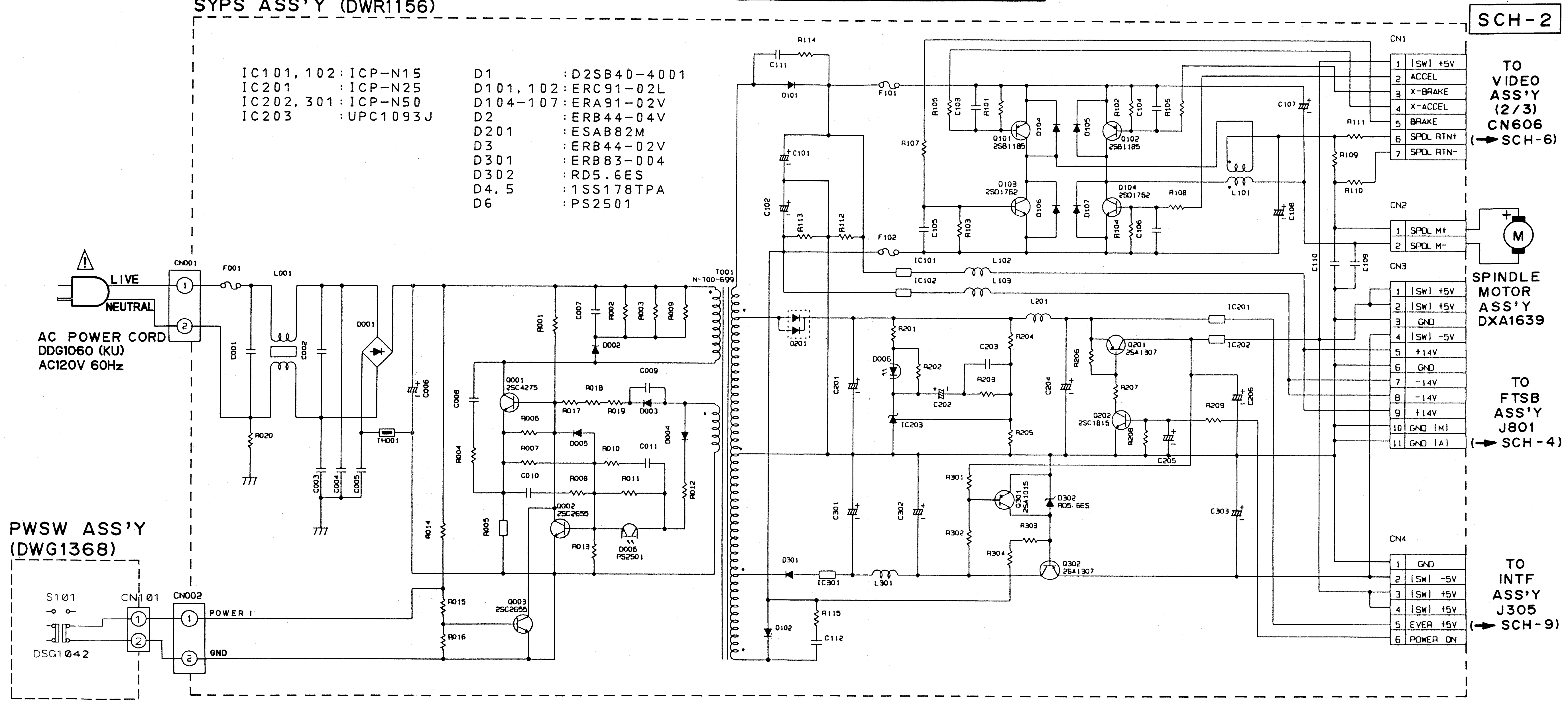
1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above Table.
3. The capacitor terminal marked with ▭ shows negative terminal.
4. The diode marked with O shows cathode side.
5. The transistor terminal marked with ▭ shows emitter.

5.1 OVERALL WIRING DIAGRAM


SCH-1
(→SCH-2)
S101 DSG1042
DWG1368
PWSW ASS'Y
SYPS ASS'Y
DWR1156
SPINDLE MOTOR ASS'Y
DXA1639
AC POWER CORD
DDG1060 AC120V 60Hz
LIVE
NEUTRAL
VIDEO ASS'Y
DWV1132
VIDEO Demodulation Section(→SCH-5)
Digital video Section(→SCH-6)
Y/C separation and Analog audio Section(→SCH-7)
CN602
CN603
CN604
CN605
J212
J211
J210
J209
CN601
CN602
CN808
CN809
CN807
CN803
CN810
CN805
CN806
J201
J202
J203
J204
PICK UP ASS'Y
CN401
CN403
CARRIAGE MOTOR ASS'Y
VXX1261
J46
CAMB ASS'Y
DWG1356
CN404
CN402
CN804
FTSB ASS'Y
DWS1191
(→SCH-4)
CONT ASS'Y
DWG1367
(→SCH-8)
CN205
CN206
CN207
LOSB ASS'Y
LOMB ASS'Y
DWG1358
DWG1357
LOADING MOTOR ASS'Y
VXX1712
J51
J55
J64
J72
(→SCH-3)
FG ASS'Y
DWG1354
PKSB ASS'Y
DWG1355
CN501
HEPB ASS'Y
DWG1363
PLYB ASS'Y
DWG1360
STBB ASS'Y
DWG1361
CLDB ASS'Y
DWG1362
J11
J12
J13
CN101
MAIN ASS'Y
DWG1359
(→SCH-11)
CN301
CN302
CN303
CN304
CN305
CN306
CN307
CN308
CN309
CN310
INTF ASS'Y
DWM1341
(→SCH-9)
120PIN CONNECTOR
GAME PACK
KARAOKE PACK
J101
J102
J103
J104
J105
CN104
CN105
JA101
JA102
JA103
JA104
JA105
JACB ASS'Y
DWX1349
(→SCH-5)
D OUT
SR
AUDIO
VIDEO
RF MOD
RGBB ASS'Y
DWM1346
(→SCH-10)

5.2 SYPS, PWSW ASS'Y

CAUTION: FOR CONTINUED PROTECTION
AGAINST RISK OF FIRE.
REPLACE WITH SAME TYPE
NO. ICP-N15, MFD BY ROHM
CO., LTD. FOR IC101 AND IC102.


SYPS ASS'Y (DWR1156)
SCH-2
IC101, 102 : ICP-N15
IC201 : ICP-N25
IC202, 301 : ICP-N50
IC203 : UPC1093J
D1 : D2SB40-4001
D101, 102 : ERC91-02L
D104-107 : ERA91-02V
D2 : ERB44-04V
D201 : ESAB82M
D3 : ERB44-02V
D301 : ERB83-004
D302 : RD5.6ES
D4, 5 : 1SS178TPA
D6 : PS2501
LIVE
NEUTRAL
AC POWER CORD
DDG1060 (KU)
AC120V 60Hz
CN001
F001
L001
C001
C002
D001
R020
C003
C004
C005
TH001
C006
T001
N-T00-699
R001
C007
R002
R003
R009
D002
C008
Q001
2SC4275
R018
C009
R017
R019
D003
R006
D005
R010
C011
D004
R004
R007
C010
R008
R011
R012
Q002
2SC2655
R005
R014
R013
D006
PS2501
R015
Q003
2SC2655
R016
CN002
POWER 1
GND
PWSW ASS'Y
(DWG1368)
S101
CN101
DSG1042
R114
C111
D101
F101
C101
C102
R113
R112
F102
R105
C103
R101
Q101
2SB1185
D104
D105
R102
Q102
2SB1185
C104
R106
R107
Q103
2SD1762
D106
D107
Q104
2SD1762
R108
C105
R103
R104
C106
IC101
L102
IC102
L103
L101
C107
R111
R109
R110
C108
C110
C109
D201
L201
R201
D006
R202
C203
R203
C202
IC203
R204
R205
R206
Q201
2SA1307
R207
C204
Q202
2SC1815
R208
C205
R209
C206
IC201
IC202
C201
R301
Q301
2SA1015
D302
RD5.6ES
R302
R303
R304
Q302
2SA1307
C301
C302
C303
D301
IC301
L301
D102
R115
C112
CN1
1 (SW) +5V
2 ACCEL
3 X-BRAKE
4 X-ACCEL
5 BRAKE
6 SPDL RTN+
7 SPDL RTN-
TO VIDEO ASS'Y (2/3) CN606 (→ SCH-6)
CN2
1 SPDL M+
2 SPDL M-
M
SPINDLE MOTOR ASS'Y DXA1639
CN3
1 (SW) +5V
2 (SW) +5V
3 GND
4 (SW) -5V
5 +14V
6 GND
7 -14V
8 -14V
9 +14V
10 GND (M)
11 GND (A)
TO FTSB ASS'Y J801 (→ SCH-4)
CN4
1 GND
2 (SW) -5V
3 (SW) +5V
4 (SW) +5V
5 EVER +5V
6 POWER ON
TO INTF ASS'Y J305 (→ SCH-9)

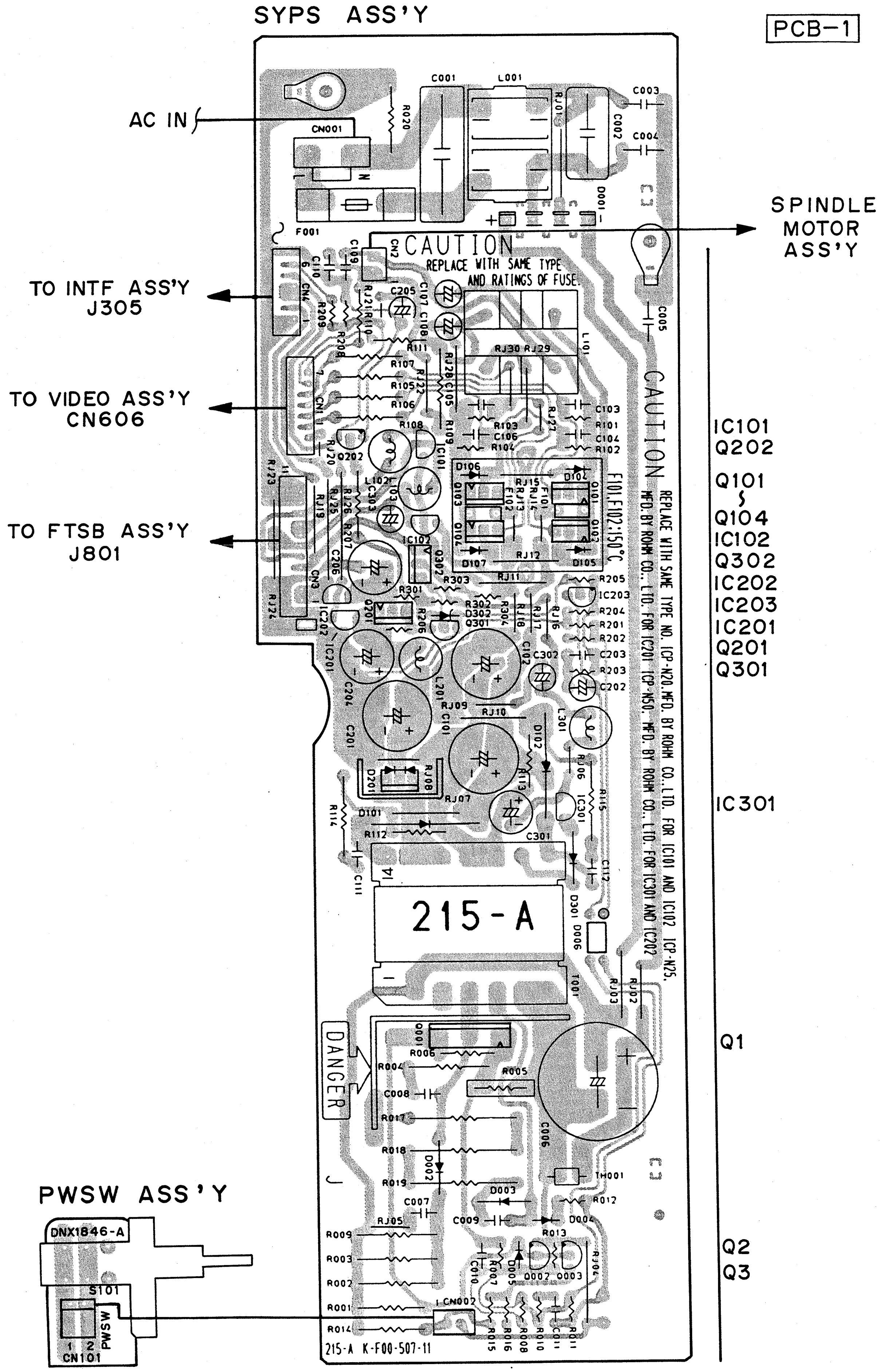
CAUTION: FOR CONTINUED PROTECTION
AGAINST RISK OF FIRE.
REPLACE WITH SAME TYPE
NO. ICP-N50, MFD BY ROHM
CO., LTD. FOR IC202 AND IC301.

CAUTION: FOR CONTINUED PROTECTION
AGAINST RISK OF FIRE.
REPLACE WITH SAME TYPE
NO. ICP-N25, MFD BY ROHM
CO., LTD. FOR IC201.

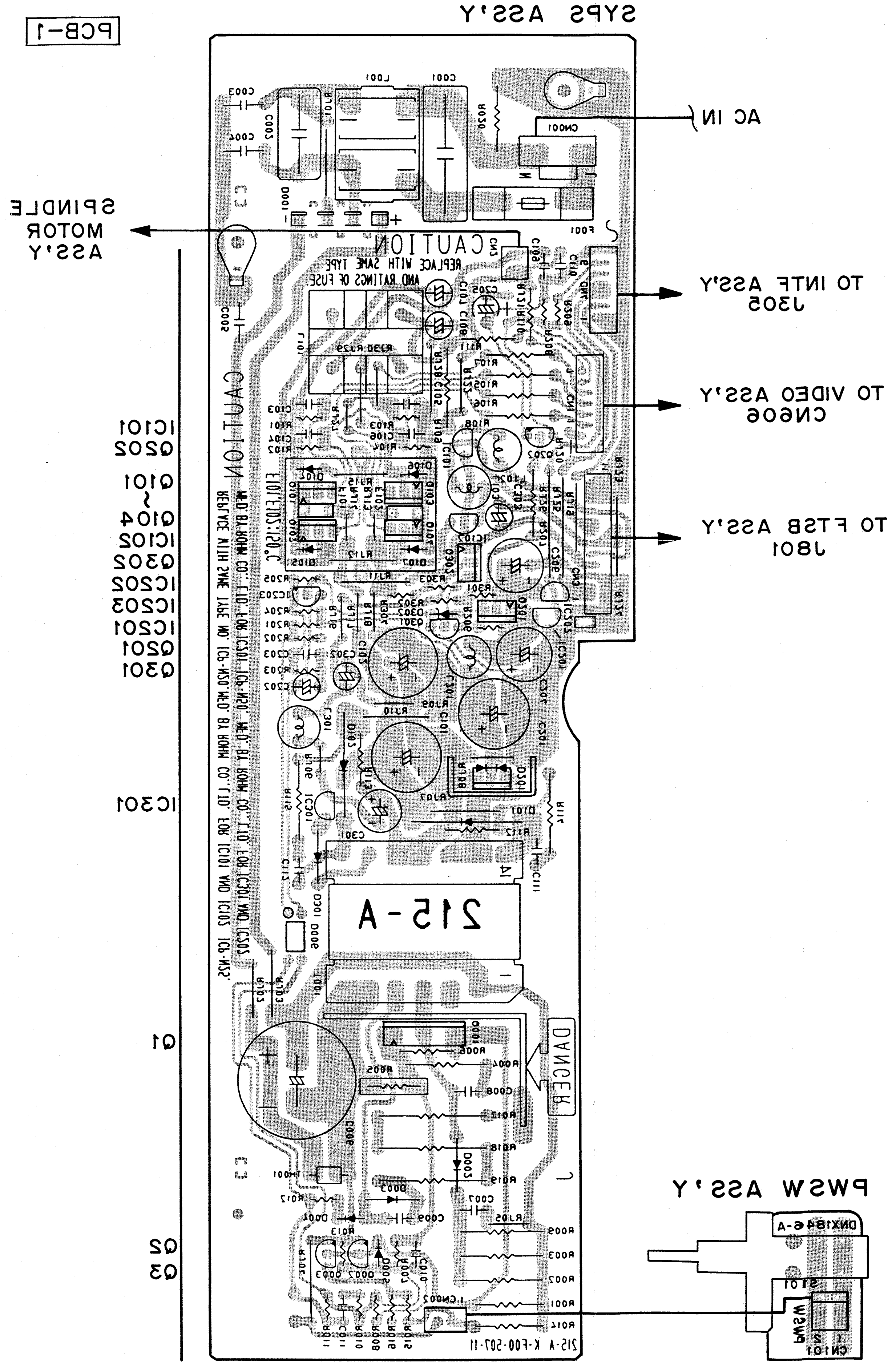
1 2 3 4 5 6

A B C D

This PCB connection diagram is viewed from the parts mounted side.

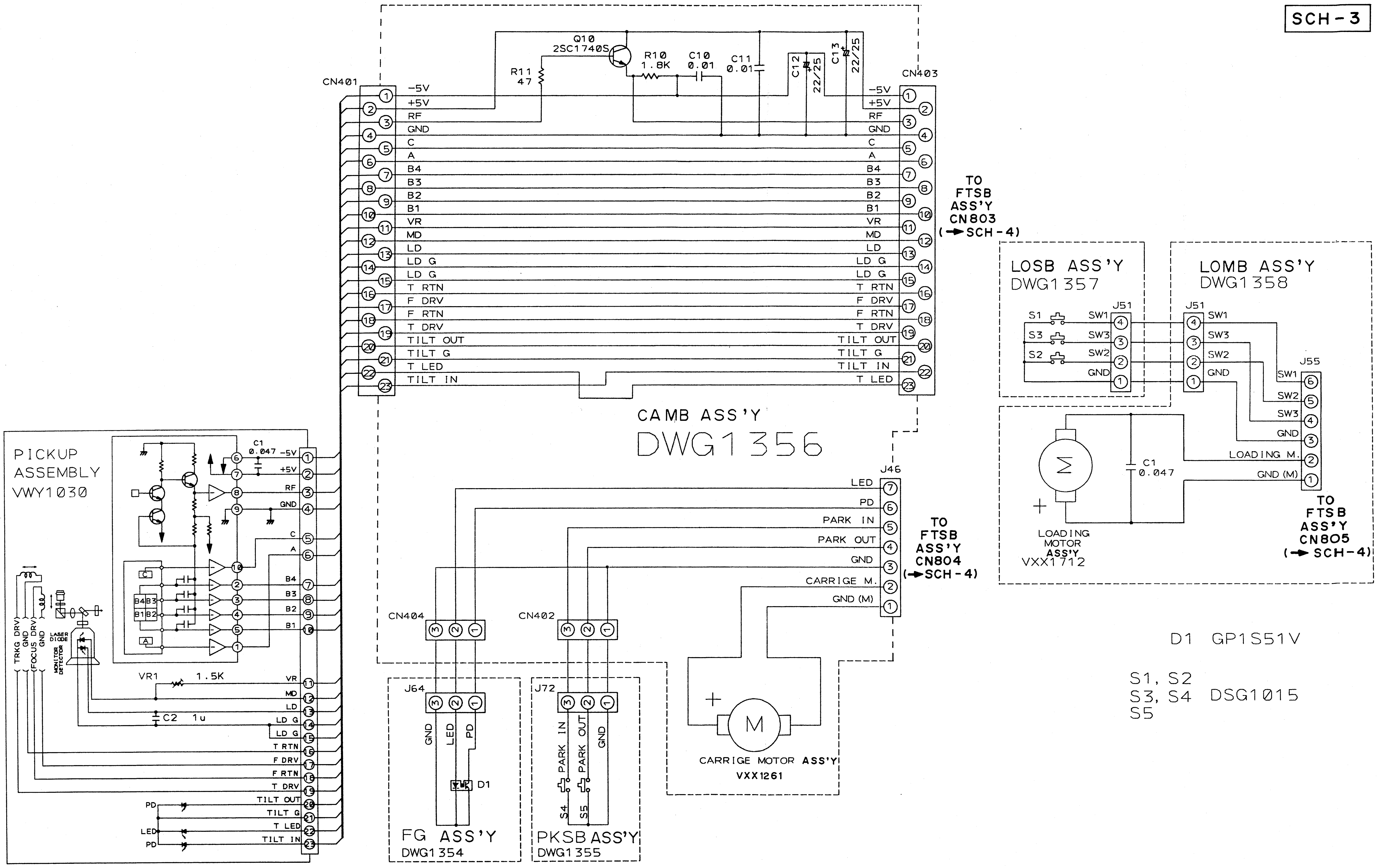

SYPS ASS'Y
PCB-1
AC IN
CN001
F001
C001
L001
C003
C004
C002
D001
SPINDLE MOTOR ASS'Y
CAUTION
REPLACE WITH SAME TYPE AND RATINGS OF FUSE.
TO INTF ASS'Y J305
TO VIDEO ASS'Y CN606
TO FTSB ASS'Y J801
CAUTION REPLACE WITH SAME TYPE NO. ICP-N20, MFD. BY ROHM CO., LTD. FOR IC201 ICP-N50, MFD. BY ROHM CO., LTD. FOR IC101 AND IC102 ICP-N25, MFD. BY ROHM CO., LTD. FOR IC301 AND IC202
F101,F102:150°C
IC101
Q202
Q101
~
Q104
IC102
Q302
IC202
IC203
IC201
Q201
Q301
IC301
215-A
T001
DANGER
Q1
Q2
Q3
PWSW ASS'Y
DNX1846-A
S101
PWSW
CN101
CN002
215-A K-F00-507-11

This PCB connection diagram is viewed from the foil side.


SYPS ASS'Y
PCB-1
AC IN
SPINDLE MOTOR ASS'Y
CAUTION
REPLACE WITH SAME TYPE AND RATINGS OF FUSE.
TO INTF ASS'Y J305
TO VIDEO ASS'Y CN606
TO FTSB ASS'Y J801
IC101
Q202
Q101
~
Q104
IC102
Q302
IC202
IC203
IC201
Q201
Q301
IC301
215-A
DANGER
Q1
Q2
Q3
PWSW ASS'Y
DNX1846-A
S101
PWSW
CN101
215-A K-F00-507-11

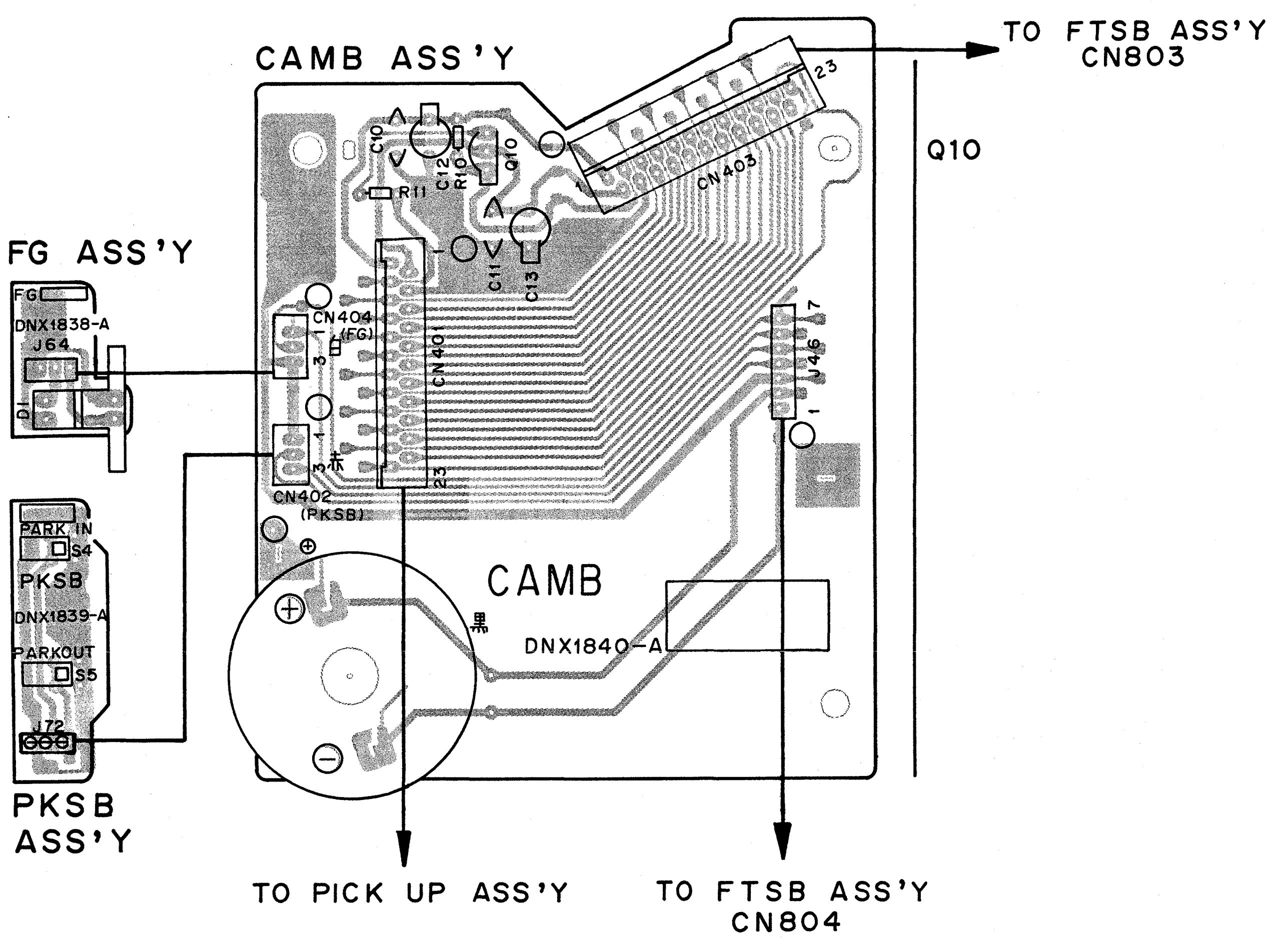
1 2 3 4 5 6

5.3 PICKUP, CAMB, FG, PKSB, LOSB, LOMB ASS'Y


SCH-3
CN401
CN403
Q10
2SC1740S
R11
47
R10
1.8K
C10
0.01
C11
0.01
C12
22/25
C13
22/25
-5V
+5V
RF
GND
C
A
B4
B3
B2
B1
VR
MD
LD
LD G
T RTN
F DRV
F RTN
T DRV
TILT OUT
TILT G
T LED
TILT IN
TO FTSB ASS'Y CN803 (→SCH-4)
CAMB ASS'Y
DWG1356
PICKUP ASSEMBLY
VWY1030
C1
0.047
VR1
1.5K
C2 1u
TRKG DRV
GND
FOCUS DRV
GND
LASER DIODE
MONITOR DETECTOR
PD
LED
PD
J46
LED
PD
PARK IN
PARK OUT
GND
CARRIGE M.
GND (M)
TO FTSB ASS'Y CN804 (→SCH-4)
CN404
CN402
J64
GND
LED
PD
D1
FG ASS'Y
DWG1354
J72
PARK IN
PARK OUT
GND
S4
S5
PKSB ASS'Y
DWG1355
CARRIGE MOTOR ASS'Y
VXX1261
LOSB ASS'Y
DWG1357
S1
S3
S2
J51
SW1
SW3
SW2
GND
LOMB ASS'Y
DWG1358
J51
SW1
SW3
SW2
GND
J55
SW1
SW2
SW3
GND
LOADING M.
GND (M)
C1
0.047
LOADING MOTOR ASS'Y
VXX1712
TO FTSB ASS'Y CN805 (→ SCH-4)
D1 GP1S51V
S1, S2
S3, S4 DSG1015
S5

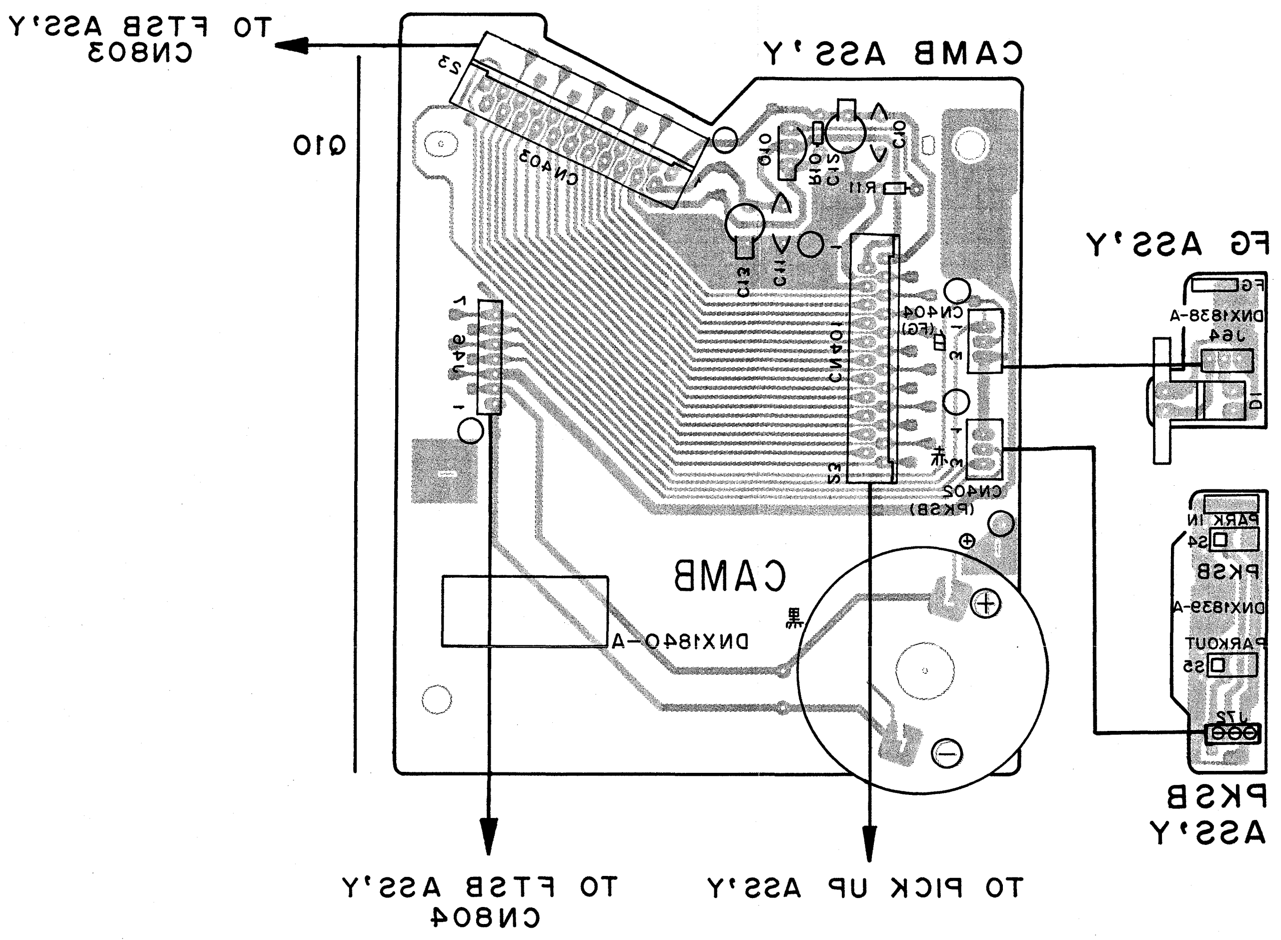
This PCB connection diagram is viewed from the parts mounted side.

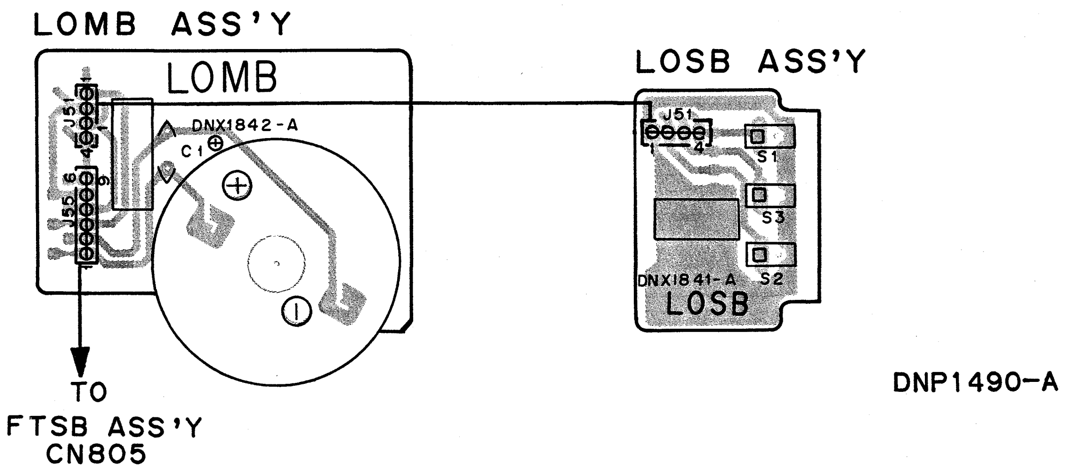
PCB-2

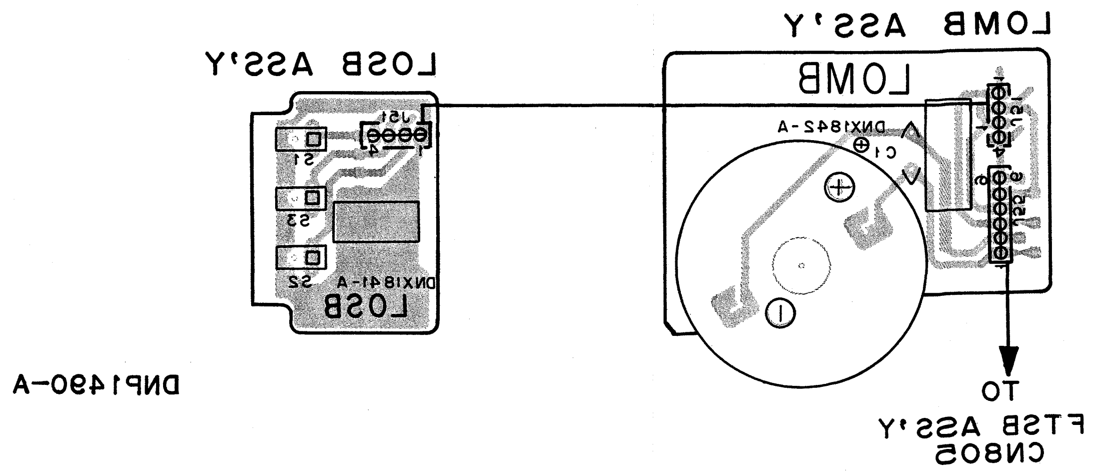

CAMB ASS'Y
TO FTSB ASS'Y CN803
Q10
C10
C12
R10
Q10
R11
C11
C13
CN403
23
FG ASS'Y
FG
DNX1838-A
J64
D1
CN404 (FG)
CN401
J46
7
1
CN402 (PKSB)
PARK IN
S4
PKSB
DNX1839-A
PARKOUT
S5
J72
PKSB ASS'Y
CAMB
DNX1840-A
TO PICK UP ASS'Y
TO FTSB ASS'Y CN804

PCB-2

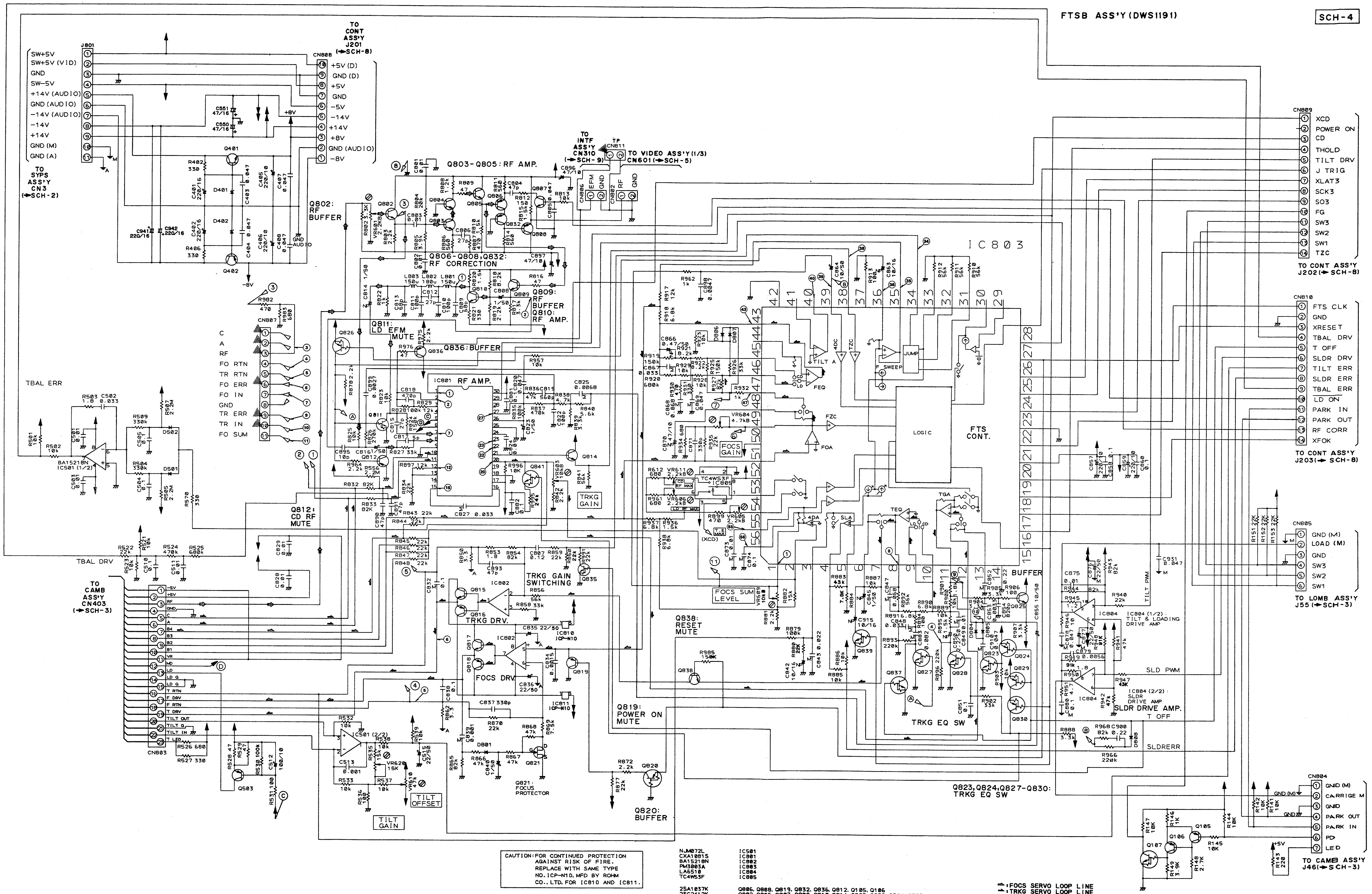
This PCB connection diagram is viewed from the foil side.


CAMB ASS'Y
TO FTSB ASS'Y CN803
Q10
CN403
FG ASS'Y
DNX1838-A
J64
CN404 (FG)
CN401
J46
CN402 (PKSB)
PARK IN
S4
PKSB
DNX1839-A
PARKOUT
S5
J72
PKSB ASS'Y
CAMB
DNX1840-A
TO PICK UP ASS'Y
TO FTSB ASS'Y CN804


LOMB ASS'Y
LOMB
J51
J55
DNX1842-A
C1
LOSB ASS'Y
S1
S3
S2
DNX1841-A
LOSB
TO FTSB ASS'Y CN805
DNP1490-A


LOSB ASS'Y
LOMB ASS'Y
LOMB
J51
J55
DNX1842-A
C1
S1
S3
S2
DNX1841-A
LOSB
DNP1490-A
TO FTSB ASS'Y CN805

5.4 FTSB ASS'Y


FTSB ASS'Y (DWS1191)
SCH-4
A
B
C
D
J801
SW+5V
SW+5V (VID)
GND
SW-5V
+14V (AUDIO)
GND (AUDIO)
-14V (AUDIO)
-14V
+14V
GND (M)
GND (A)
TO SYPS ASS'Y CN3 (➡SCH-2)
TO CONT ASS'Y J201 (➡SCH-8)
CN808
+5V (D)
GND (D)
+5V
GND
-5V
-14V
+14V
+8V
GND (AUDIO)
-8V
Q802: RF BUFFER
Q803-Q805: RF AMP.
Q806-Q808,Q832: RF CORRECTION
Q809: RF BUFFER
Q810: RF AMP.
Q811: LD EFM MUTE
Q836: BUFFER
IC801 RF AMP.
Q812: CD RF MUTE
TO INTF ASS'Y CN310 (➡SCH-9)
TP CN811
TO VIDEO ASS'Y (1/3) CN601 (➡SCH-5)
EFM
GND
RF
CN807
C
A
RF
FO RTN
TR RTN
FO ERR
FO IN
GND
TR ERR
TR IN
FO SUM
TBAL ERR
TBAL DRV
BA15218N IC501 (1/2)
TO CAMB ASS'Y CN403 (➡SCH-3)
CN803
TRKG GAIN
TRKG GAIN SWITCHING
TRKG DRV.
FOCS DRV
IC810 ICP-N10
IC811 ICP-N10
Q821: FOCUS PROTECTOR
Q820: BUFFER
TILT GAIN
TILT OFFSET
Q838: RESET MUTE
Q819: POWER ON MUTE
FOCS GAIN
FOCS SUM LEVEL
IC803
LOGIC
FTS CONT.
TILT A
FEQ
FZC
FOA
F SWEEP
JUMP
TEQ
TGA
SLA
4DA
BUFFER
TRKG EQ SW
Q823,Q824,Q827-Q830: TRKG EQ SW
IC804 (1/2) TILT & LOADING DRIVE AMP
IC804 (2/2) SLDR DRIVE AMP
SLDR DRIVE AMP.
SLD PWM
T OFF
SLDRERR
TILT PWM
CN809
XCD
POWER ON
CD
THOLD
TILT DRV
J TRIG
XLAT3
SCK3
SO3
FG
SW3
SW2
SW1
TZC
TO CONT ASS'Y J202 (➡SCH-8)
CN810
FTS CLK
GND
XRESET
TBAL DRV
T OFF
SLDR DRV
TILT ERR
SLDR ERR
TBAL ERR
LD ON
PARK IN
PARK OUT
RF CORR
XFOK
TO CONT ASS'Y J203 (➡SCH-8)
CN805
GND (M)
LOAD (M)
GND
SW3
SW2
SW1
TO LOMB ASS'Y J55 (➡SCH-3)
CN804
GND (M)
CARRIGE M
GND
PARK OUT
PARK IN
PD
LED
TO CAMB ASS'Y J46 (➡SCH-3)
Q105
Q106
Q107

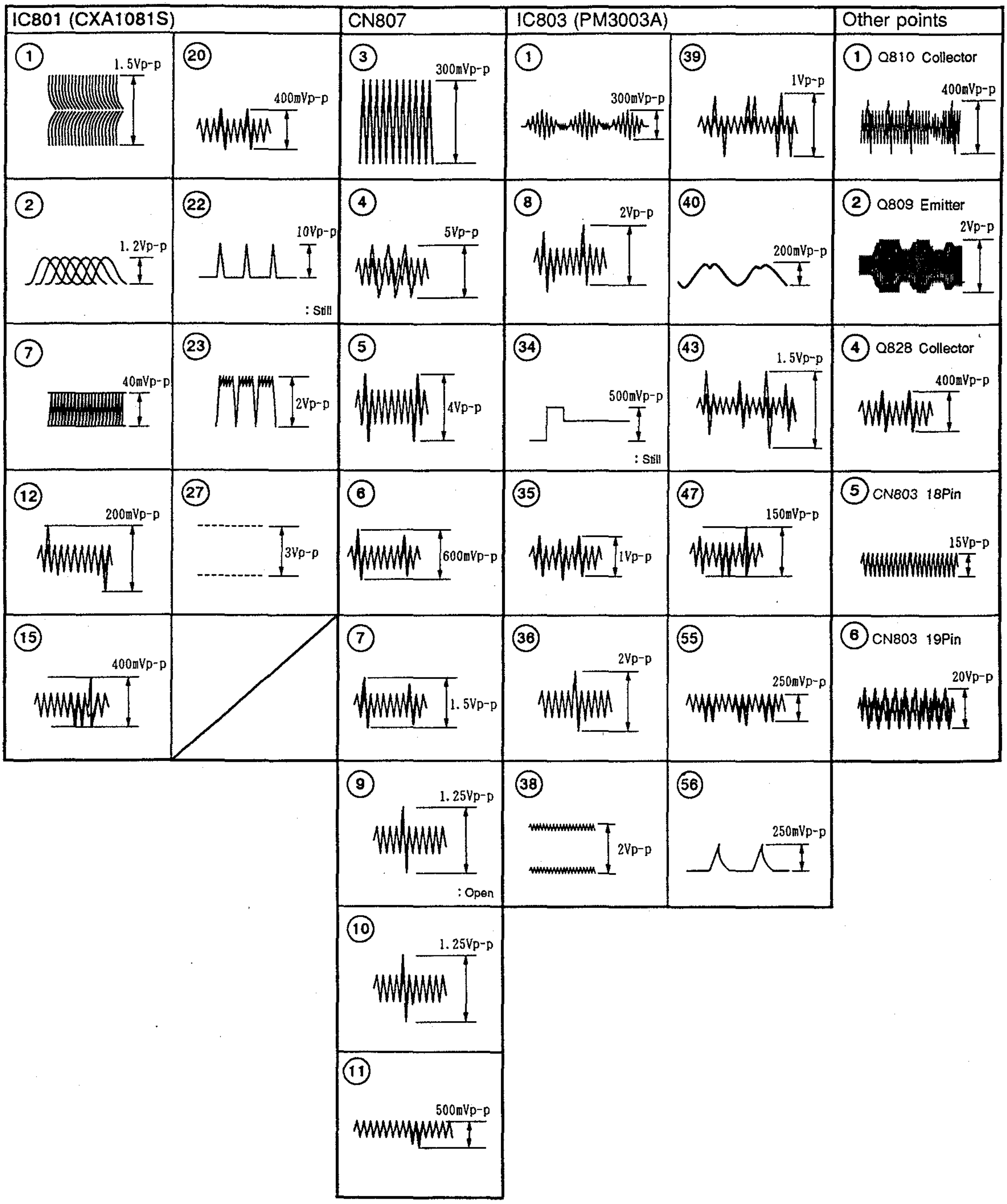
CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE. REPLACE WITH SAME TYPE NO. ICP-N10, MFD BY ROHM CO., LTD. FOR IC810 AND IC811.

NJM072L	IC501
CXA1081S	IC801
BA15218N	IC802
PM3003A	IC803
LA6510	IC804
TC4W53F	IC805
2SA1037K	Q806, Q808, Q819, Q832, Q836, Q812, Q105, Q106
2SC2412K	Q802-Q805, Q807, Q809, Q810, Q814, Q825, Q838, Q504-Q506
DTA124EK	Q820, Q824, Q826, Q829, Q830
DTC124EK	Q811, Q823, Q827, Q828, Q835, Q837, Q839, Q107, Q841
2SB1185	Q816, Q818, Q402
2SD1762	Q815, Q817, Q401
2SA1399	Q503
2SK184	Q821
1SS254	D801, D804-D808, D501, D502
MTZ9.1C	D401, D402

⇨ : FOCS SERVO LOOP LINE
➡ : TRKG SERVO LOOP LINE
⇨ : RF SIGNAL LINE

WAVEFORMS AND VOLTAGE TABLES
FTS SECTION

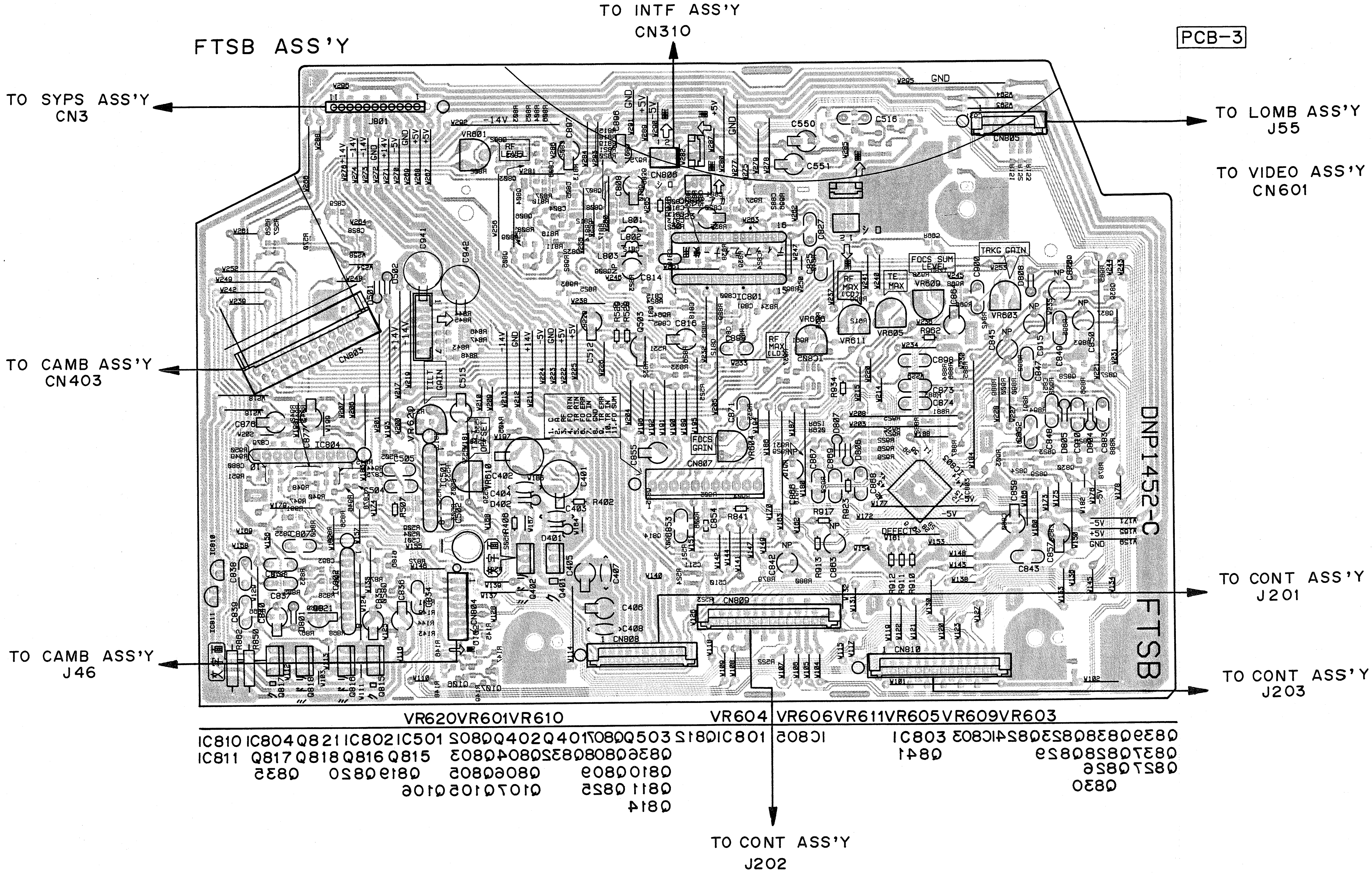
Note : (No.) in the table correspond to the pin number.


IC801 (CXA1081S)
① 1.5Vp-p
② 1.2Vp-p
⑦ 40mVp-p
⑫ 200mVp-p
⑮ 400mVp-p
⑳ 400mVp-p
㉒ 10Vp-p
: Still
㉓ 2Vp-p
㉗ 3Vp-p
CN807
③ 300mVp-p
④ 5Vp-p
⑤ 4Vp-p
⑥ 600mVp-p
⑦ 1.5Vp-p
⑨ 1.25Vp-p
: Open
⑩ 1.25Vp-p
⑪ 500mVp-p
IC803 (PM3003A)
① 300mVp-p
⑧ 2Vp-p
㉞ 500mVp-p
: Still
㉟ 1Vp-p
㊱ 2Vp-p
㊳ 2Vp-p
㊴ 1Vp-p
㊵ 200mVp-p
㊸ 1.5Vp-p
㊼ 150mVp-p
(55) 250mVp-p
(56) 250mVp-p
Other points
① Q810 Collector
400mVp-p
② Q809 Emitter
2Vp-p
④ Q828 Collector
400mVp-p
⑤ CN803 18Pin
15Vp-p
⑥ CN803 19Pin
20Vp-p

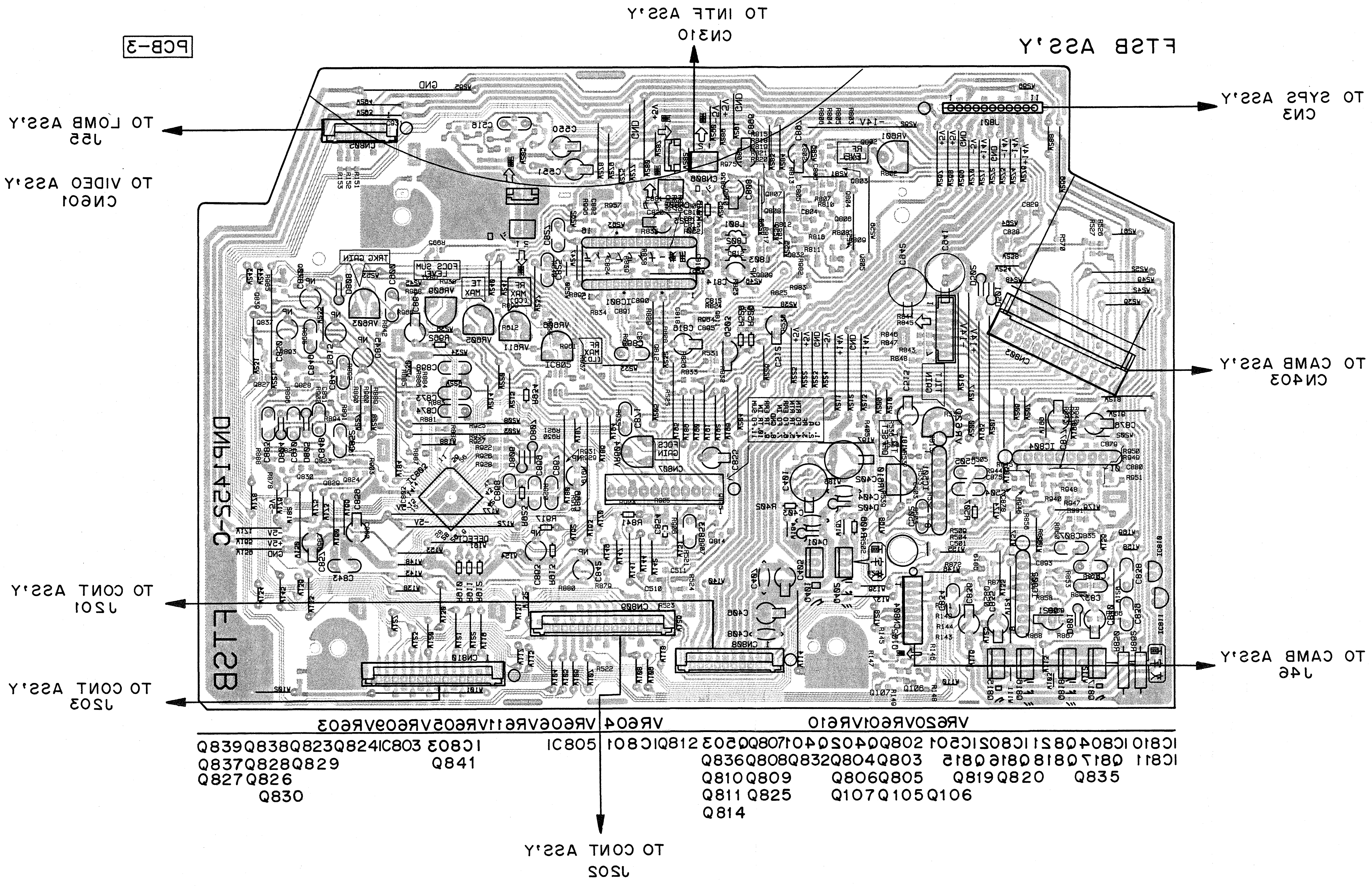
This PCB connection diagram is viewed from the parts mounted side.

FTSB ASS'Y

PCB-3


TO INTF ASS'Y
CN310
TO SYPS ASS'Y
CN3
TO LOMB ASS'Y
J55
TO VIDEO ASS'Y
CN601
TO CAMB ASS'Y
CN403
TO CONT ASS'Y
J201
TO CAMB ASS'Y
J46
TO CONT ASS'Y
J203
TO CONT ASS'Y
J202
DNP1452-C
FTSB
CN801
CN805
CN803
CN806
CN807
CN808
CN809
CN810
CN804
IC801
IC804
IC501
RF LEVEL
RF MAX
TE MAX
FOCS SUM LEVEL
TRKG GAIN
FOCS GAIN
TILT GAIN
OFFSET
VR601
VR603
VR604
VR605
VR606
VR609
VR610
VR611
VR620
VR620VR601VR610
VR604 VR606VR611VR605VR609VR603
IC810 IC804 Q821 IC802 IC501
IC811 Q817 Q818 Q816 Q815
IC801
IC805
Q841

This PCB connection diagram is viewed from the foil side.

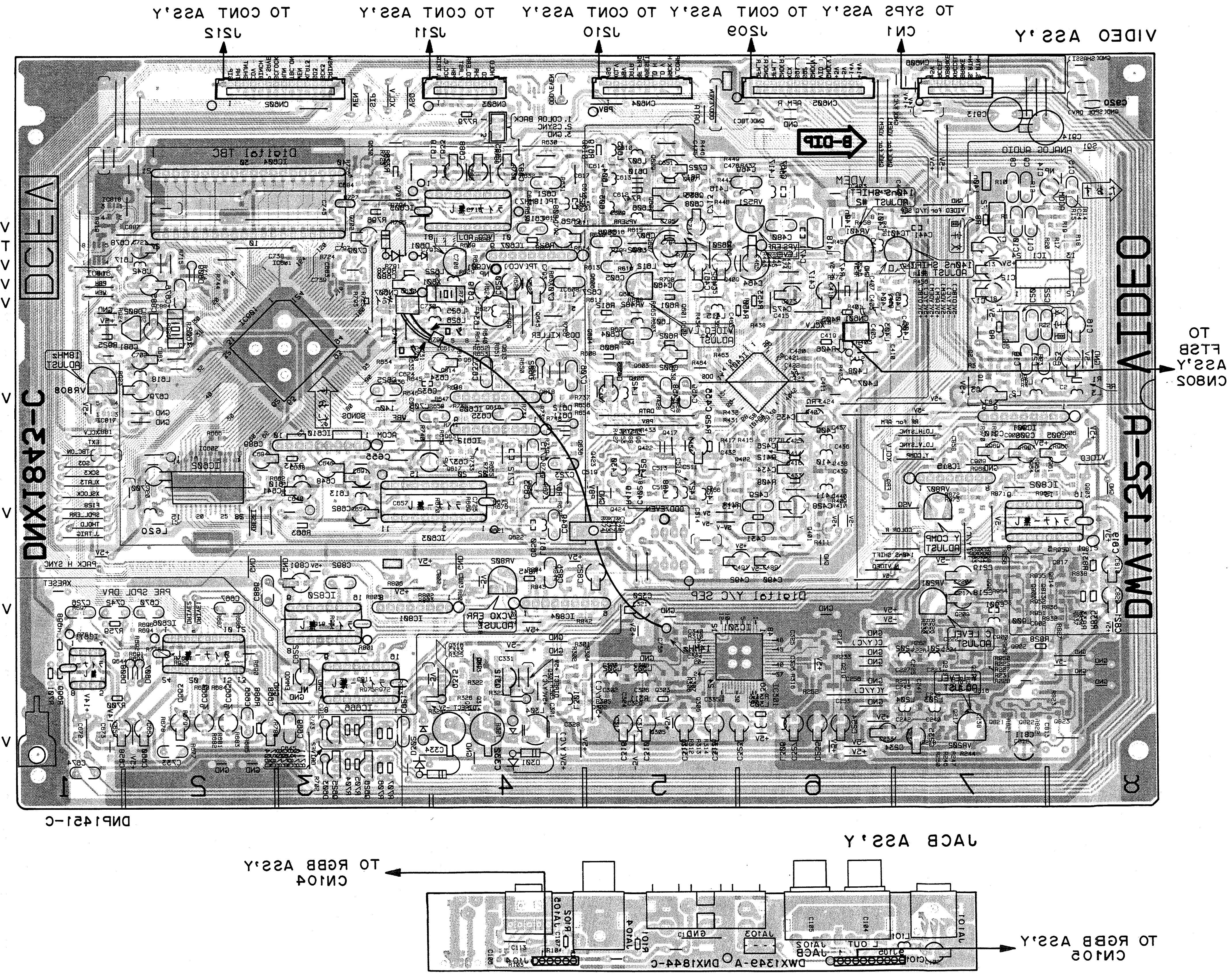

PCB-3
FTSB ASS'Y
TO INTF ASS'Y
CN310
TO SYPS ASS'Y
CN3
TO LOMB ASS'Y
J55
TO VIDEO ASS'Y
CN601
TO CAMB ASS'Y
CN403
TO CONT ASS'Y
J201
TO CAMB ASS'Y
J46
TO CONT ASS'Y
J203
TO CONT ASS'Y
J202
FTSB
DNP1452-C
VR606 VR611 VR605 VR609 VR603
VR604
VR620 VR601 VR610
Q839 Q838 Q823 Q824 IC803 IC803
Q837 Q828 Q829
Q827 Q826
Q830
Q841
IC805
IC801 Q812 Q503 Q807 Q401 Q402 Q802 IC501 IC802 Q821 IC804 IC810
Q836 Q808 Q832 Q804 Q803 Q815 Q816 Q818 Q817 IC811
Q810 Q809 Q806 Q805 Q819 Q820 Q835
Q811 Q825 Q107 Q105 Q106
Q814

- This PCB is double sided.
- Foil patterm for each side is identified with pink and gray. Black colored parts are mounted on the pink foil side; red colored parts on the gray foil side.
- This diagram is viewed from red colored parts side.

PCB-4

Q630 Q610 Q609
Q407 IC604
Q701 Q408 IC403 Q633
IC818 Q611 Q608 Q432
Q702 IC605 VR521
Q703 Q607 IC607 TC401
IC816 Q430 Q431 IC1 VR401
IC601 Q606 Q409 VC901
IC608 Q605 VR482
Q645 Q601
Q604 Q602 IC601
IC613 Q615 Q613 Q603 Q2
Q614 Q612 Q406 Q1 IC401
Q618 IC601 VR808
IC817 Q616 IC901
Q631 Q417 IC612
IC602 Q636 Q422 IC610
Q617 Q423 Q402 Q816 IC602
Q619 Q624 Q903 IC815
Q424 IC603 VR807
Q621 Q811 IC802
Q622 Q401 Q815

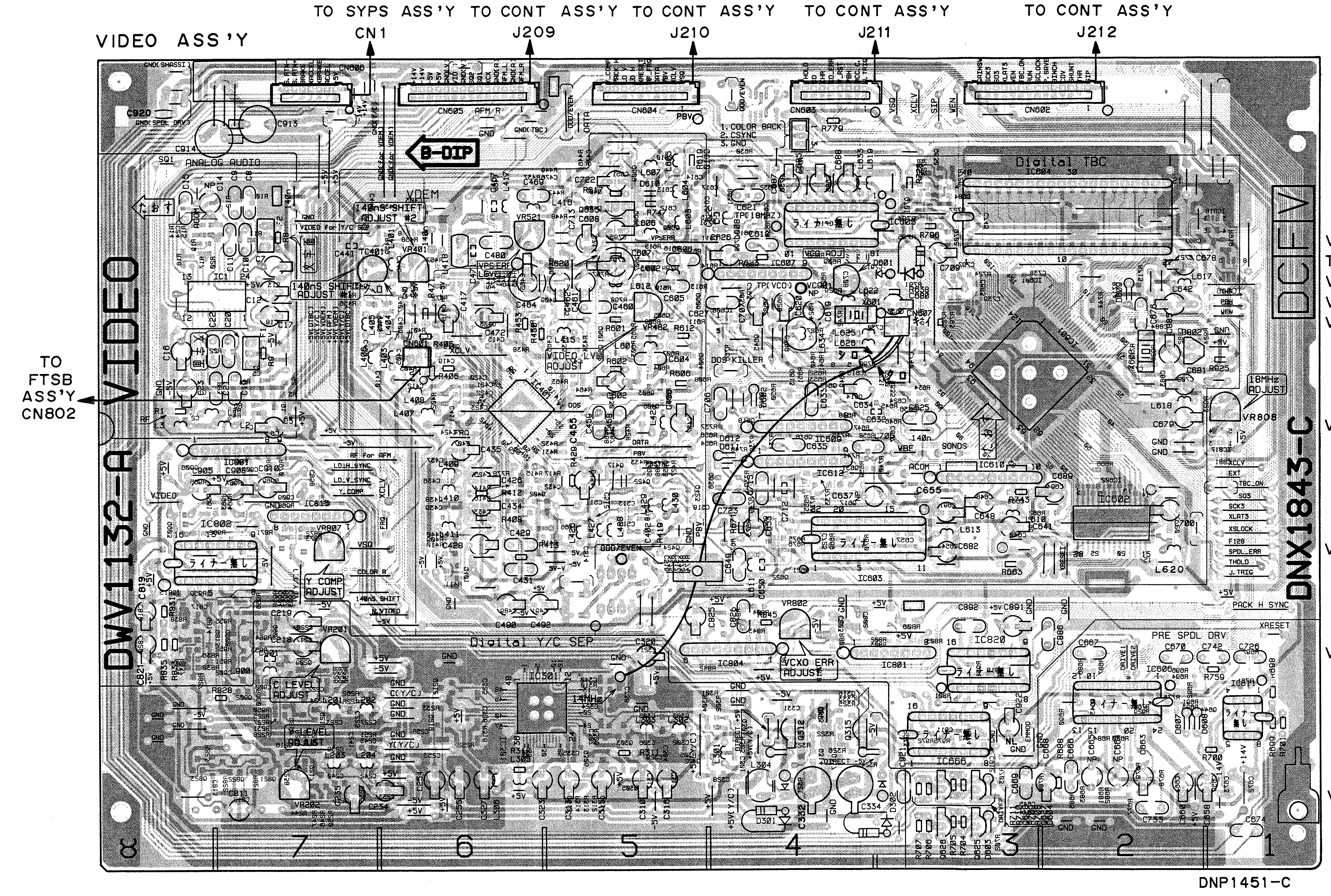
Q901 Q814 IC804
Q900 Q813 IC801 VR201
Q818 Q817 Q209 IC820
Q316 Q212 Q902 IC301
Q644 Q643 Q313 Q211 IC606
Q301 Q219 Q210 IC611 Q312
Q314 Q303 Q216 IC666 Q315
IC301 Q317 Q302 Q306 Q217
Q305 Q628 VR202
Q218 Q627
Q626
Q625


VIDEO ASS'Y
TO CONT ASS'Y J212
TO CONT ASS'Y J211
TO CONT ASS'Y J210
TO CONT ASS'Y J209
TO SYPS ASS'Y CN1
TO FTSB ASS'Y CN802
DNX1842-C
DWV1125-A VIDEO
DCEA
Digital TBC
Digital Y/C SEP
B-DIP
ANALOG AUDIO
DNP1451-C
JACB ASS'Y
TO RGBB ASS'Y CN104
TO RGBB ASS'Y CN105
DWX1349-A DNX1844-C
1
2
3
4
5
6
7
8

- This PCB is double sided.
- Foil pattern for each side is identified with pink and gray. Black colored parts are mounted on the pink foil side; red colored parts on the gray foil side.
- This diagram is viewed from black colored parts side.

PCB-4

A

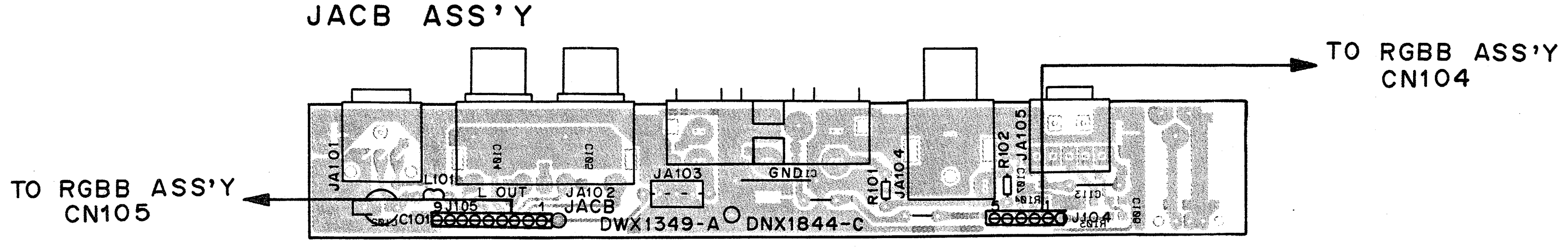

VIDEO ASS'Y
TO SYPS ASS'Y CN1
TO CONT ASS'Y J209
TO CONT ASS'Y J210
TO CONT ASS'Y J211
TO CONT ASS'Y J212
TO FTSB ASS'Y CN802
DWV1132-A VIDEO
DNX1843-C
DCFV
Digital TBC
Digital Y/C SEP
B-DIP
ANALOG AUDIO
140nS SHIFT ADJUST #2
140nS SHIFT ADJUST #1
VIDEO LVL ADJUST
18MHz ADJUST
VCXO ERR ADJUST
Y COMP ADJUST
C LEVEL ADJUST
Y LEVEL ADJUST
PRE SPDL DRV
8 7 6 5 4 3 2 1

DNP1451-C

	Q609 Q610 Q630
	IC604 Q407
	Q633 IC403 Q408 Q701
	Q432 Q608 Q611 IC818
VR521	IC605 Q702
TC401	IC607 Q607 Q703
VR401	IC1 Q431 Q430 IC816
VC901	Q409 Q606 IC601
VR482	Q605 IC608
	Q601 Q645
	IC601 Q602 Q604
	Q2 Q603 Q613 Q615 IC613
	IC401 Q1 Q406 Q612 Q614
VR808	IC601 Q618
	IC901 Q616 IC817
	IC612 Q417 Q631
	IC610 Q422 Q636 IC602
	IC602 Q816 Q402 Q423 Q617
	IC815 Q903 Q624 Q619
VR807	IC603 Q424
	IC802 Q811 Q621
	Q815 Q401 Q622
	IC804 Q814 Q901
VR201	IC801 Q813 Q900
	IC820 Q209 Q817 Q818
	IC301 Q902 Q212 Q316
	IC606 Q211 Q313 Q643 Q644
	IC611 Q312 Q210 Q219 Q301
	IC666 Q315 Q216 Q303 Q314
	Q217 Q306 Q302 Q317 IC301
VR202	Q628 Q305
	Q627 Q218
	Q626
	Q625

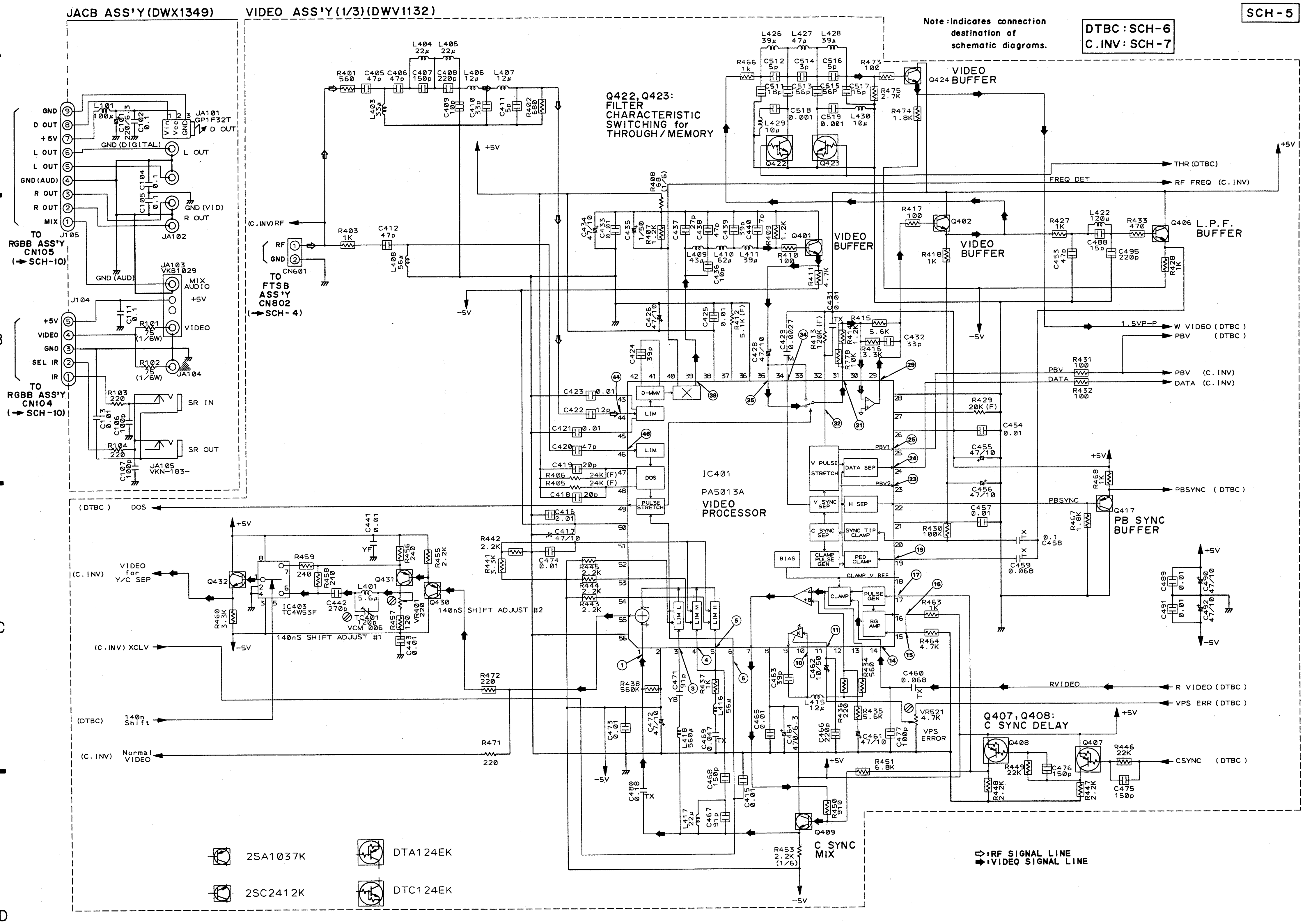
B

C


JACB ASS'Y
TO RGBB ASS'Y CN104
TO RGBB ASS'Y CN105
JA101
L101
L OUT
JA102
JACB
JA103
GND
R101
JA104
R102
JA105
J105
C101
J104
DWX1349-A
DNX1844-C

D

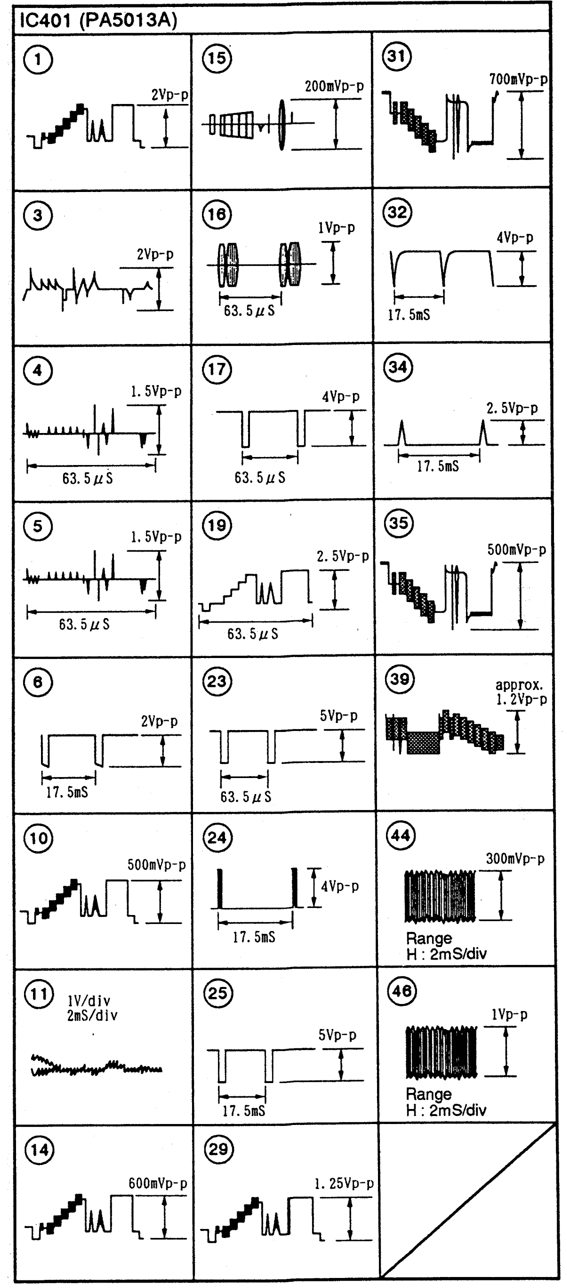
5.5 VIDEO ASS'Y (1/3) (VIDEO DEMODULATION), JACB ASS'Y


JACB ASS'Y (DWX1349)
VIDEO ASS'Y (1/3) (DWV1132)
SCH-5
Note: Indicates connection destination of schematic diagrams.
DTBC: SCH-6
C.INV: SCH-7
TO RGBB ASS'Y CN105 (→ SCH-10)
TO RGBB ASS'Y CN104 (→ SCH-10)
GND, D OUT, +5V, L OUT, L OUT, GND (AUD), R OUT, R OUT, MIX
+5V, VIDEO, GND, SEL IR, IR
JA101 GP1F32T D OUT
JA102
JA103 VKB1029 MIX AUDIO VIDEO
JA104
JA105 VKN-183-
SR IN
SR OUT
GND (DIGITAL)
GND (AUD)
GND (VID)
TO FTSB ASS'Y CN802 (→ SCH-4)
RF
CN601
(C.INV) RF
Q422, Q423: FILTER CHARACTERISTIC SWITCHING for THROUGH/MEMORY
Q424 VIDEO BUFFER
Q401 VIDEO BUFFER
Q402 VIDEO BUFFER
Q406 L.P.F. BUFFER
Q417 PB SYNC BUFFER
Q407, Q408: C SYNC DELAY
Q409 C SYNC MIX
Q430, Q431, Q432
VIDEO for Y/C SEP
140nS SHIFT ADJUST #1
140nS SHIFT ADJUST #2
IC401 PA5013A VIDEO PROCESSOR
D-MMV, LIM, DOS, PULSE STRETCH, V PULSE STRETCH, DATA SEP, V SYNC SEP, H SEP, C SYNC SEP, SYNC TIP CLAMP, CLAMP PULSE GEN, PED CLAMP, BIAS, CLAMP V REF, CLAMP, PULSE GEN, BG AMP, LIM L, LIM M, LIM H
IC403 TC4W53F
VR521 4.7K VPS ERROR
THR (DTBC)
FREQ DET
RF FREQ (C.INV)
W VIDEO (DTBC)
PBV (DTBC)
PBV (C.INV)
DATA (C.INV)
PBSYNC (DTBC)
R VIDEO (DTBC)
VPS ERR (DTBC)
CSYNC (DTBC)
(DTBC) DOS
(C.INV) XCLV
(DTBC) 140n Shift
(C.INV) Normal VIDEO
+5V
-5V
2SA1037K
2SC2412K
DTA124EK
DTC124EK
⇨: RF SIGNAL LINE
➡: VIDEO SIGNAL LINE

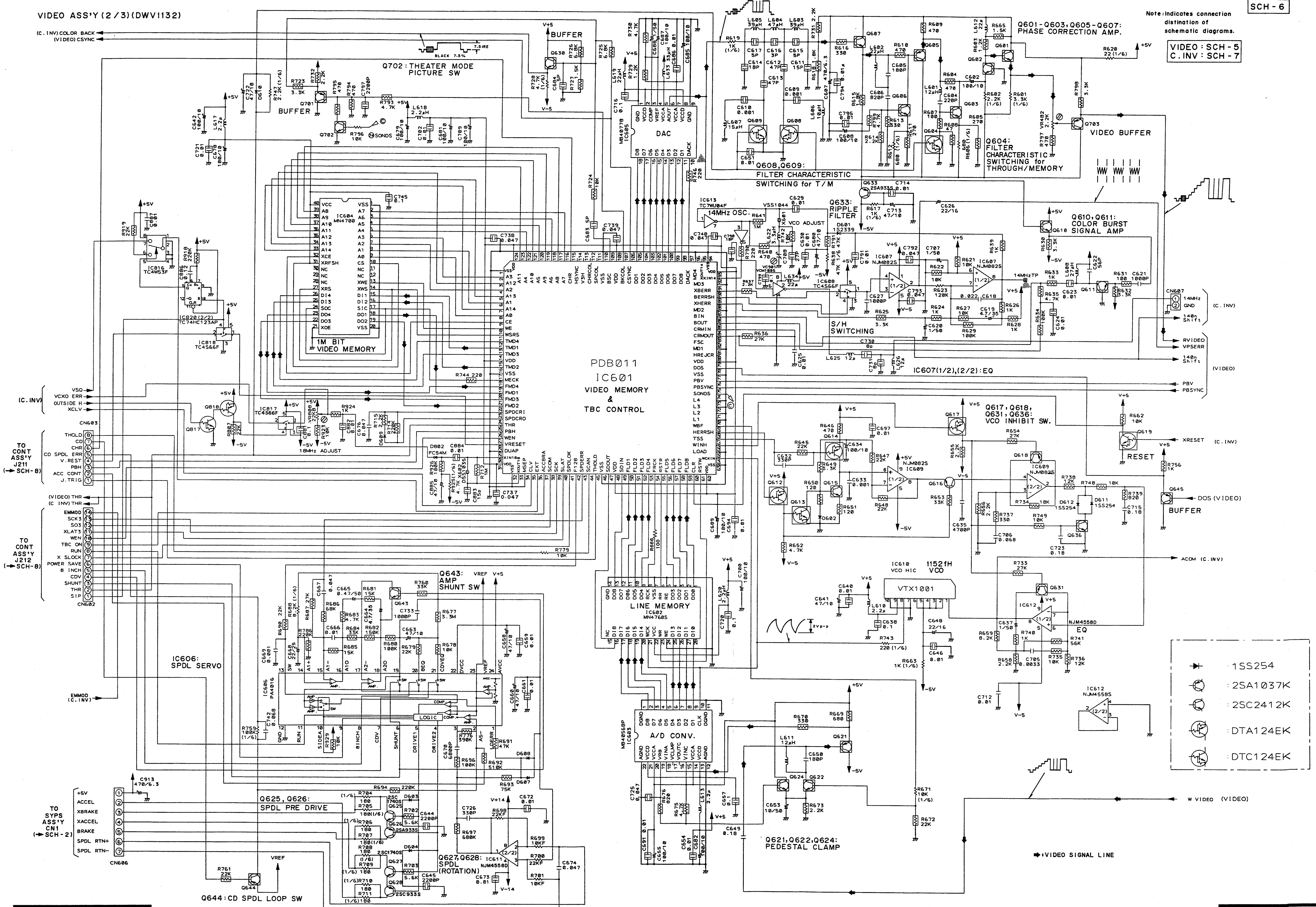
WAVEFORMS AND VOLTAGE TABLES VIDEO SECTION

Note : (No.) in the table correspond to the pin number.

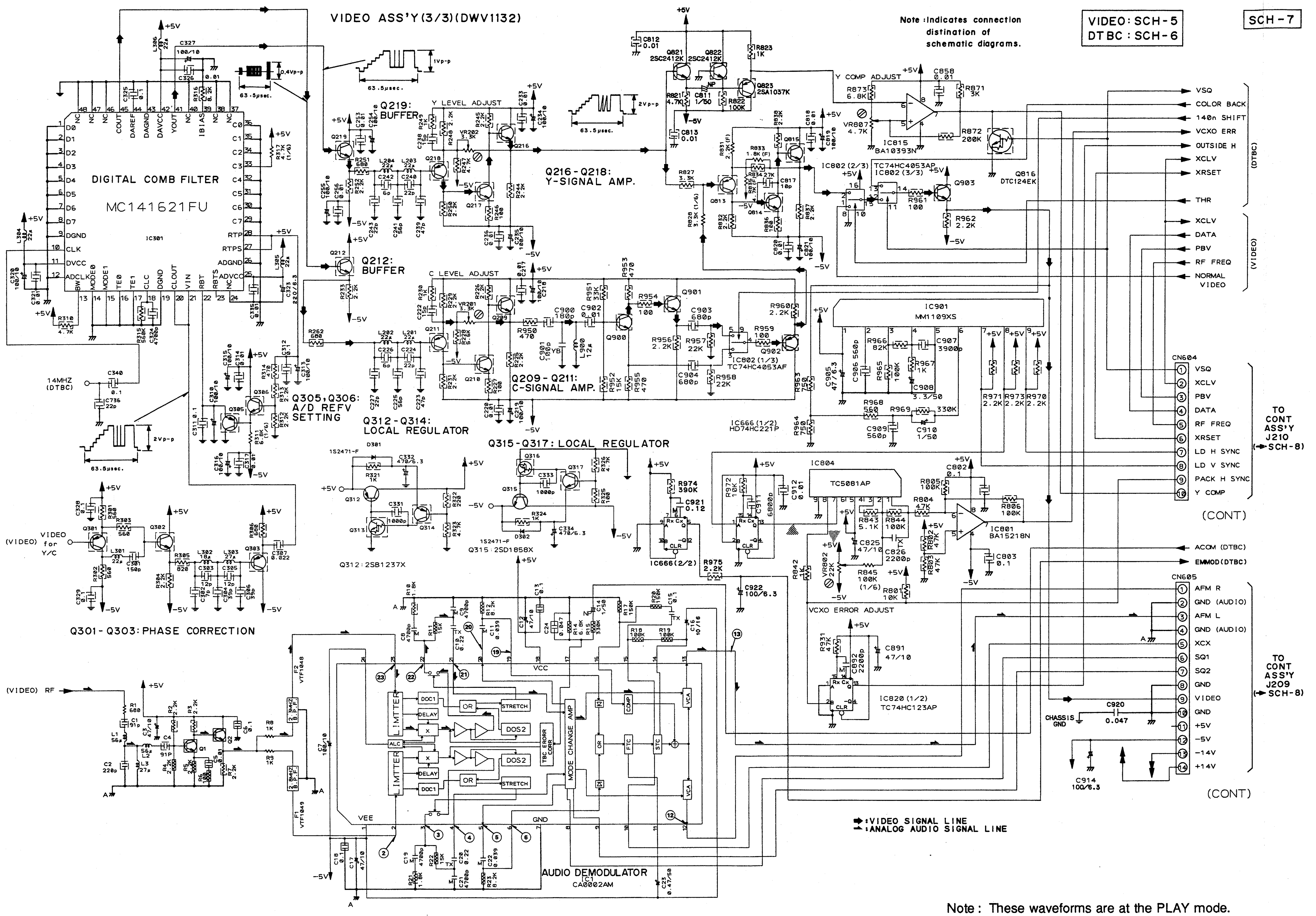
IC401 (PA5013A)



5.6 VIDEO ASS'Y (2/3) (DIGITAL VIDEO)

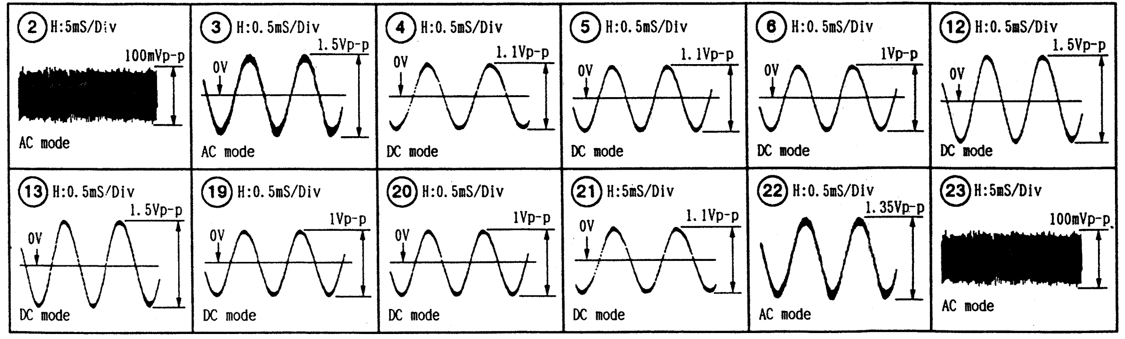

VIDEO ASS'Y (2/3)(DWV1132)
(C.INV) COLOR BACK
(VIDEO) CSYNC
SCH-6
Note: indicates connection distination of schematic diagrams.
VIDEO : SCH-5
C.INV : SCH-7
Q702: THEATER MODE PICTURE SW
BUFFER
Q701 BUFFER
Q601-Q603, Q605-Q607: PHASE CORRECTION AMP.
Q608, Q609: FILTER CHARACTERISTIC SWITCHING for T/M
Q604: FILTER CHARACTERISTIC SWITCHING for THROUGH/MEMORY
Q703 VIDEO BUFFER
DAC
IC605 MB40778
IC613 TC7WU04F
14MHz OSC
VCO ADJUST
Q633: RIPPLE FILTER
Q610, Q611: COLOR BURST SIGNAL AMP
IC604 MN4700
1M BIT VIDEO MEMORY
IC816 TC4W53F
IC820 (2/2) TC74HC123AP
IC818 TC4S66F
IC817 TC4S66F
10MHz ADJUST
PDB011
IC601
VIDEO MEMORY & TBC CONTROL
S/H SWITCHING
IC607 (1/2),(2/2): EQ
CN607 14MHz GND 14Ω Shift (C.INV)
RVIDEO VPSERR 14Ω Shift (VIDEO)
PBV PBSYNC
Q617, Q618, Q631, Q636: VCO INHIBIT SW.
RESET
XRESET (C.INV)
DOS (VIDEO)
BUFFER
ACOM (C.INV)
VSO VCXO ERR OUTSIDE H XCLV (C.INV)
CN603
TO CONT ASS'Y J211 (→SCH-8)
THOLD CD CHR CD SPDL ERR V.REST PBH ACC CONT J.TRIG
(VIDEO) THR
(C.INV) THR
TO CONT ASS'Y J212 (→SCH-8)
EMMOD SCK3 SO3 XLAT3 WEN TBC ON RUN X SLOCK POWER SAVE 8 INCH CDV SHUNT THR SIP
CN602
Q643: AMP SHUNT SW
IC606: SPDL SERVO
IC606 PA4016
LOGIC
EMMOD (C.INV)
LINE MEMORY
IC602 MN4760S
IC610 VCO HIC
1152fH VCO
VTX1001
2Vp-p
IC612 NJM4558D EQ
A/D CONV.
IC603 MB40568P
Q621, Q622, Q624: PEDESTAL CLAMP
W VIDEO (VIDEO)
→: VIDEO SIGNAL LINE
TO SYPS ASS'Y CN1 (→SCH-2)
+5V ACCEL XBRAKE XACCEL BRAKE SPDL RTN+ SPDL RTN-
CN606
Q625, Q626: SPDL PRE DRIVE
Q627, Q628: SPDL (ROTATION)
IC611 NJM4558D
Q644: CD SPDL LOOP SW
1SS254
2SA1037K
2SC2412K
DTA124EK
DTC124EK
IC612 NJM4558S

5.7 VIDEO ASS'Y (3/3) (Y/C SEPARATION AND ANALOG AUDIO)


VIDEO ASS'Y (3/3)(DWV1132)
Note: Indicates connection distination of schematic diagrams.
VIDEO: SCH-5
DTBC: SCH-6
SCH-7
DIGITAL COMB FILTER
MC141621FU
IC301
Q219: BUFFER
Y LEVEL ADJUST
Q216-Q218: Y-SIGNAL AMP.
Q212: BUFFER
C LEVEL ADJUST
Q209-Q211: C-SIGNAL AMP.
Q305, Q306: A/D REFV SETTING
Q312-Q314: LOCAL REGULATOR
Q315-Q317: LOCAL REGULATOR
Q312: 2SB1237X
Q315: 2SD1858X
Q301-Q303: PHASE CORRECTION
(VIDEO) VIDEO for Y/C
(VIDEO) RF
14MHZ (DTBC)
Q821 2SC2412K
Q822 2SC2412K
Q823 2SA1037K
Y COMP ADJUST
VR807 4.7K
IC815 BA10393N
IC802 (2/3) TC74HC4053AP
IC802 (3/3)
Q903
Q816 DTC124EK
IC901 MM1109XS
IC802 (1/3) TC74HC4053AF
IC666 (1/2) HD74HC221P
IC666 (2/2)
IC804 TC5081AP
IC801 BA15218N
VCXO ERROR ADJUST
IC820 (1/2) TC74HC123AP
VSQ
COLOR BACK
140n SHIFT
VCXO ERR
OUTSIDE H
XCLV
XRSET
THR
(DTBC)
XCLV
DATA
PBV
RF FREQ
NORMAL VIDEO
(VIDEO)
CN604
1 VSQ
2 XCLV
3 PBV
4 DATA
5 RF FREQ
6 XRSET
7 LD H SYNC
8 LD V SYNC
9 PACK H SYNC
10 Y COMP
TO CONT ASS'Y J210 (→SCH-8)
(CONT)
ACOM (DTBC)
EMMOD (DTBC)
CN605
1 AFM R
2 GND (AUDIO)
3 AFM L
4 GND (AUDIO)
5 XCX
6 SQ1
7 SQ2
8 GND
9 VIDEO
10 GND
11 +5V
12 -5V
13 -14V
14 +14V
TO CONT ASS'Y J209 (→SCH-8)
(CONT)
CHASSIS GND
LIMITTER
DOC1
DELAY
ALC
OR
STRETCH
DOS2
TBC ERROR CORR.
AMP
MODE CHANGE
COMP
FTC
STC
VCA
VCC
VEE
GND
AUDIO DEMODULATOR
IC1 CA0002AM
F2 VTF1648
F1 VTF1649
63.5μsec.
0.4Vp-p
1Vp-p
2Vp-p
➡: VIDEO SIGNAL LINE
⟶: ANALOG AUDIO SIGNAL LINE

Note: These waveforms are at the PLAY mode.

● IC1 (CA0002AM) Note: (No.) in the table correspond to the pin number.

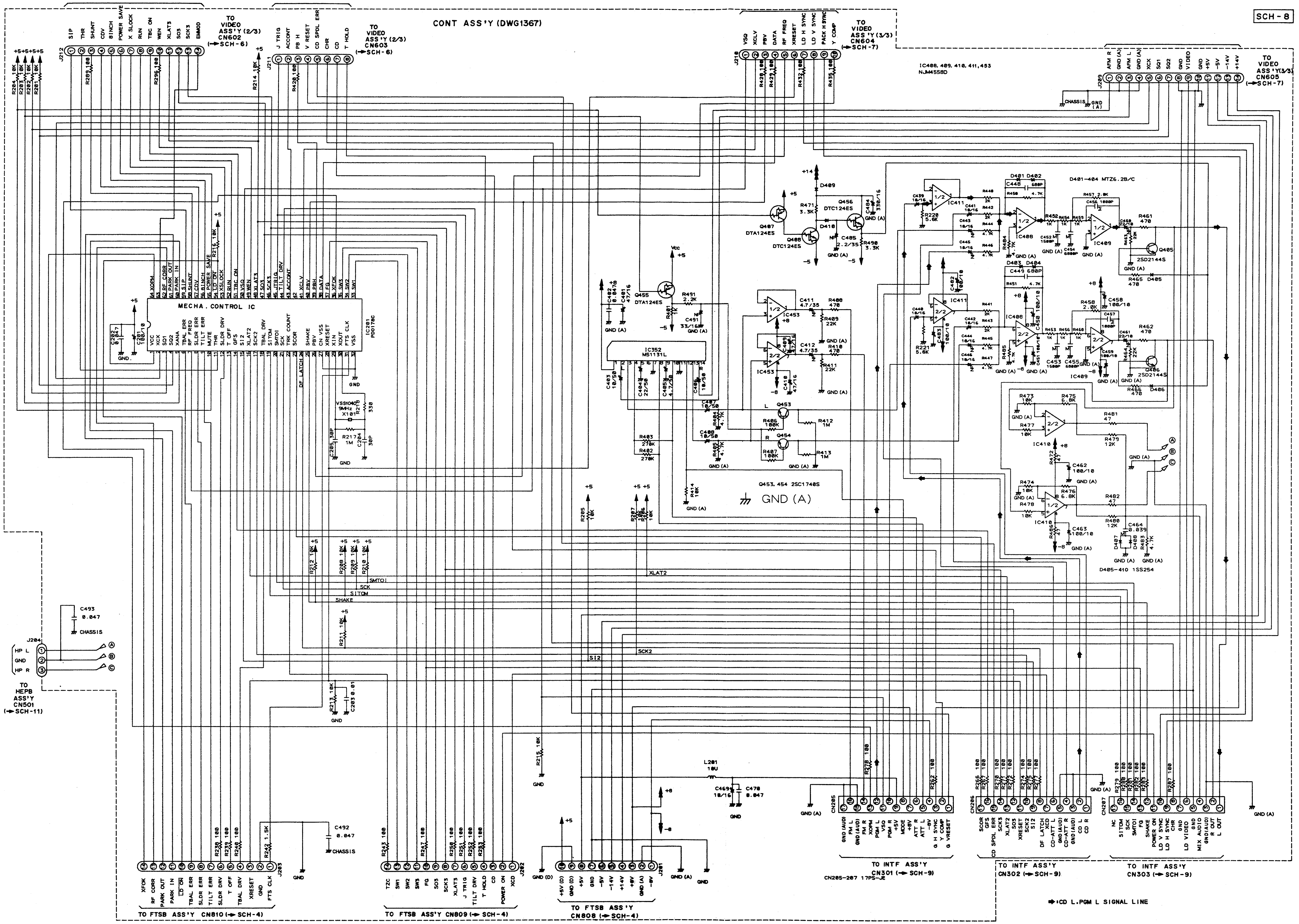


● IC1 (CA0002AM)

Pin No.	Voltage [V]	Pin No.	Voltage [V]
1	– 5	13	*
2	*	14	– 0.6
3	*	15	– 0.6
4	*	16	0
5	*	17	0
6	*	18	5
7	0	19	*
8	0	20	*
9	0	21	*
10	5	22	*
11	2	23	*
12	*	24	– 2.2

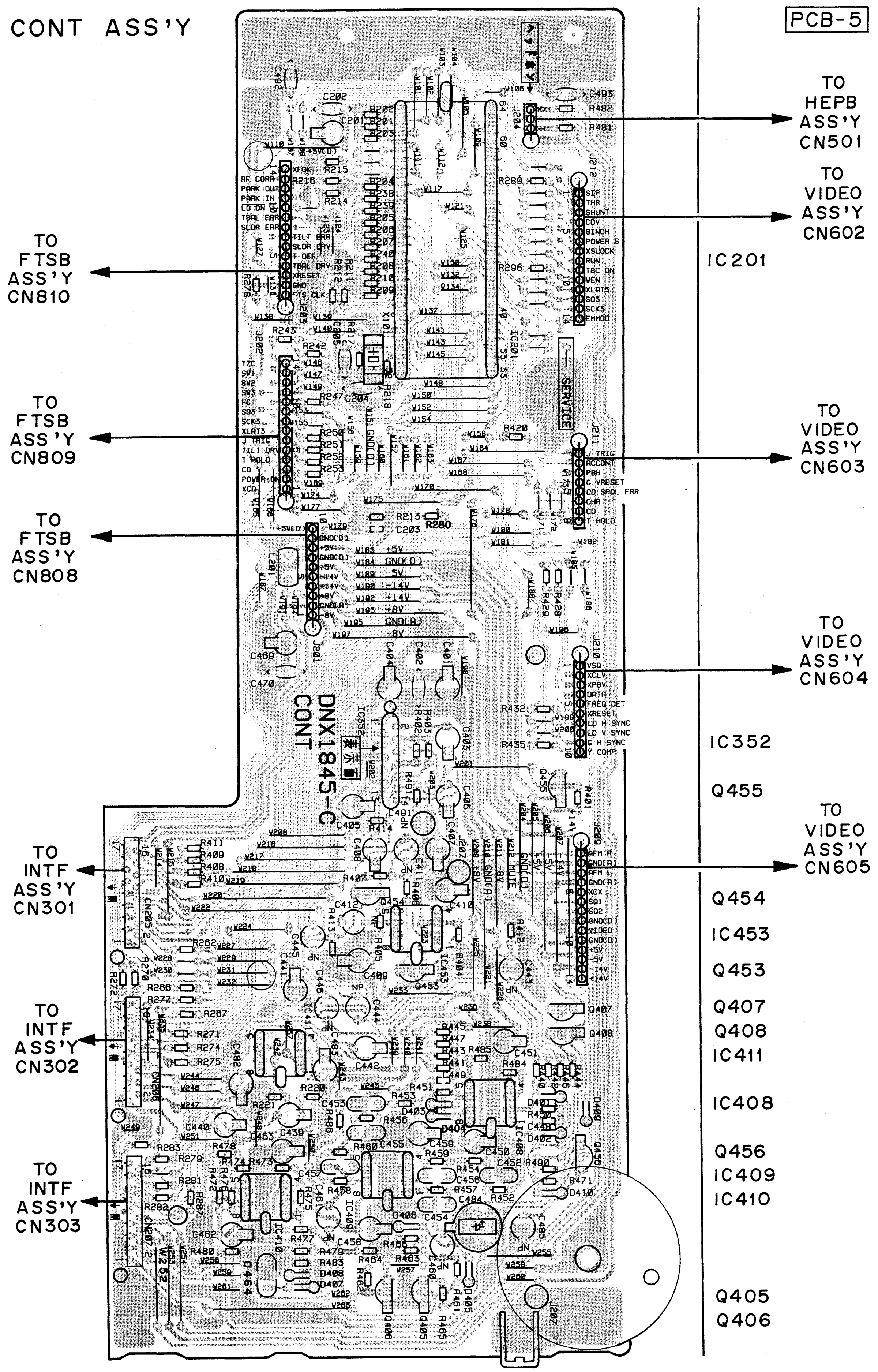
* : Refer to waveforms

5.8 CONT ASS'Y (CONTROL)


CONT ASS'Y (DWG1367)
SCH-8
TO VIDEO ASS'Y (2/3) CN602 (→SCH-6)
TO VIDEO ASS'Y (2/3) CN603 (→SCH-6)
TO VIDEO ASS'Y (3/3) CN604 (→SCH-7)
TO VIDEO ASS'Y (3/3) CN605 (→SCH-7)
J212
J211
J218
J209
MECHA. CONTROL IC
IC201 PD0780C
IC352 M51131L
IC408, 409, 410, 411, 453 NJM4558D
D401-404 MTZ6.2B/C
Q453, 454 2SC1740S
D405-410 1SS254
Q455 DTA124ES
Q456 DTC124ES
Q487 DTA124ES
Q488 DTC124ES
Q405 2SD2144S
Q406 2SD2144S
VSS1040 9MHz X101
GND (A)
CHASSIS
J204
HP L
GND
HP R
TO HEPB ASS'Y CN501 (→SCH-11)
XLAT2
SMTO1
SCK
SITOM
SHAKE
SI2
SCK2
L201 10U
CN285
CN286
CN287
TO INTF ASS'Y CN301 (→SCH-9)
CN285-287 17PS-JE
TO INTF ASS'Y CN302 (→SCH-9)
TO INTF ASS'Y CN303 (→SCH-9)
➡:CD L, PGM L SIGNAL LINE
J283
J282
J281
TO FTSB ASS'Y CN810 (→SCH-4)
TO FTSB ASS'Y CN809 (→SCH-4)
TO FTSB ASS'Y CN808 (→SCH-4)
1
2
3
4
5
6
A
B
C
D

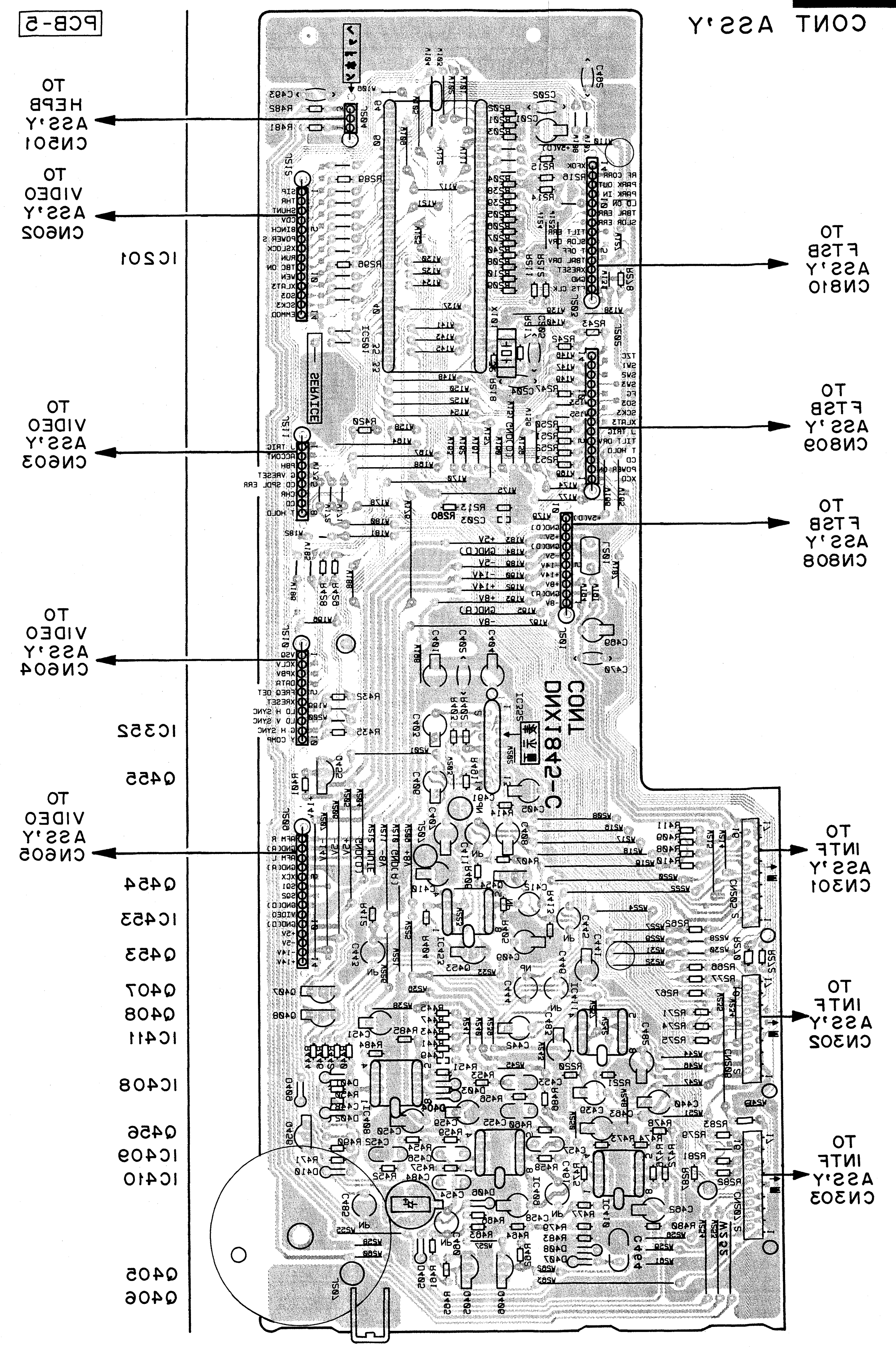
SCH-8 CONT ASSY

CONT ASSY SCH-8


CONT ASS'Y
PCB-5
TO HEPB ASS'Y CN501
TO VIDEO ASS'Y CN602
TO FTSB ASS'Y CN810
TO FTSB ASS'Y CN809
TO VIDEO ASS'Y CN603
TO FTSB ASS'Y CN808
TO VIDEO ASS'Y CN604
TO VIDEO ASS'Y CN605
TO INTF ASS'Y CN301
TO INTF ASS'Y CN302
TO INTF ASS'Y CN303
IC201
IC352
Q455
Q454
IC453
Q453
Q407
Q408
IC411
IC408
Q456
IC409
IC410
Q405
Q406
DNX1845-C
CONT
SERVICE
A
B
C
D

This PCB connection diagram is viewed from the parts mounted side.

DNP1488-C

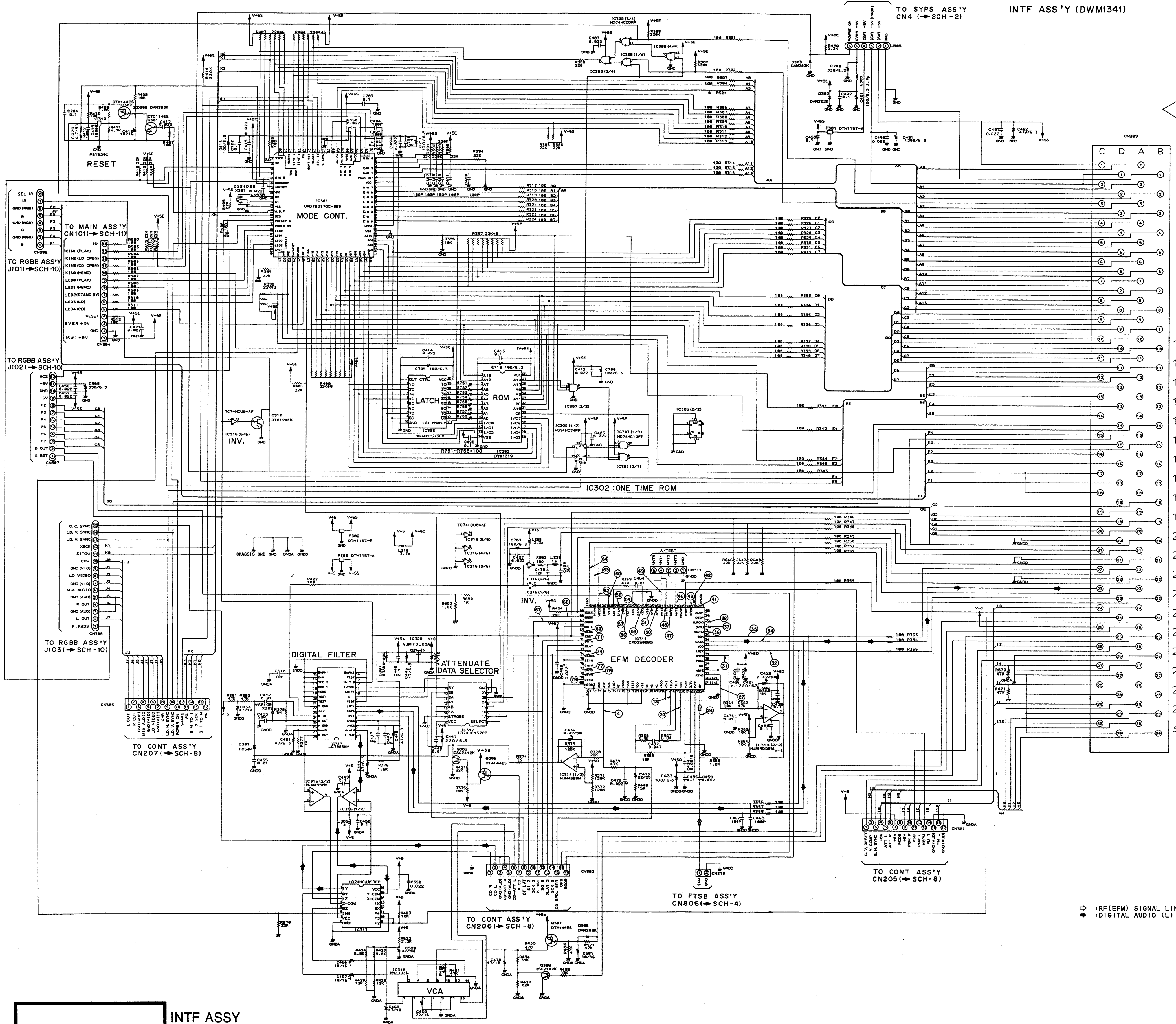

CONT ASS'Y
PCB-5
TO HEPB ASS'Y CN501
TO VIDEO ASS'Y CN602
TO FTSB ASS'Y CN810
TO FTSB ASS'Y CN809
TO VIDEO ASS'Y CN603
TO FTSB ASS'Y CN808
TO VIDEO ASS'Y CN604
TO VIDEO ASS'Y CN605
TO INTF ASS'Y CN301
TO INTF ASS'Y CN302
TO INTF ASS'Y CN303
IC201
IC352
Q455
Q454
IC453
Q453
Q407
Q408
IC411
IC408
Q456
IC409
IC410
Q405
Q406
A
B
C
D

DNP1488-C This PCB connection diagram is viewed from the foil side.

5.9 INTF ASS'Y (INTERFACE)

INTF ASS'Y (DWM1341)

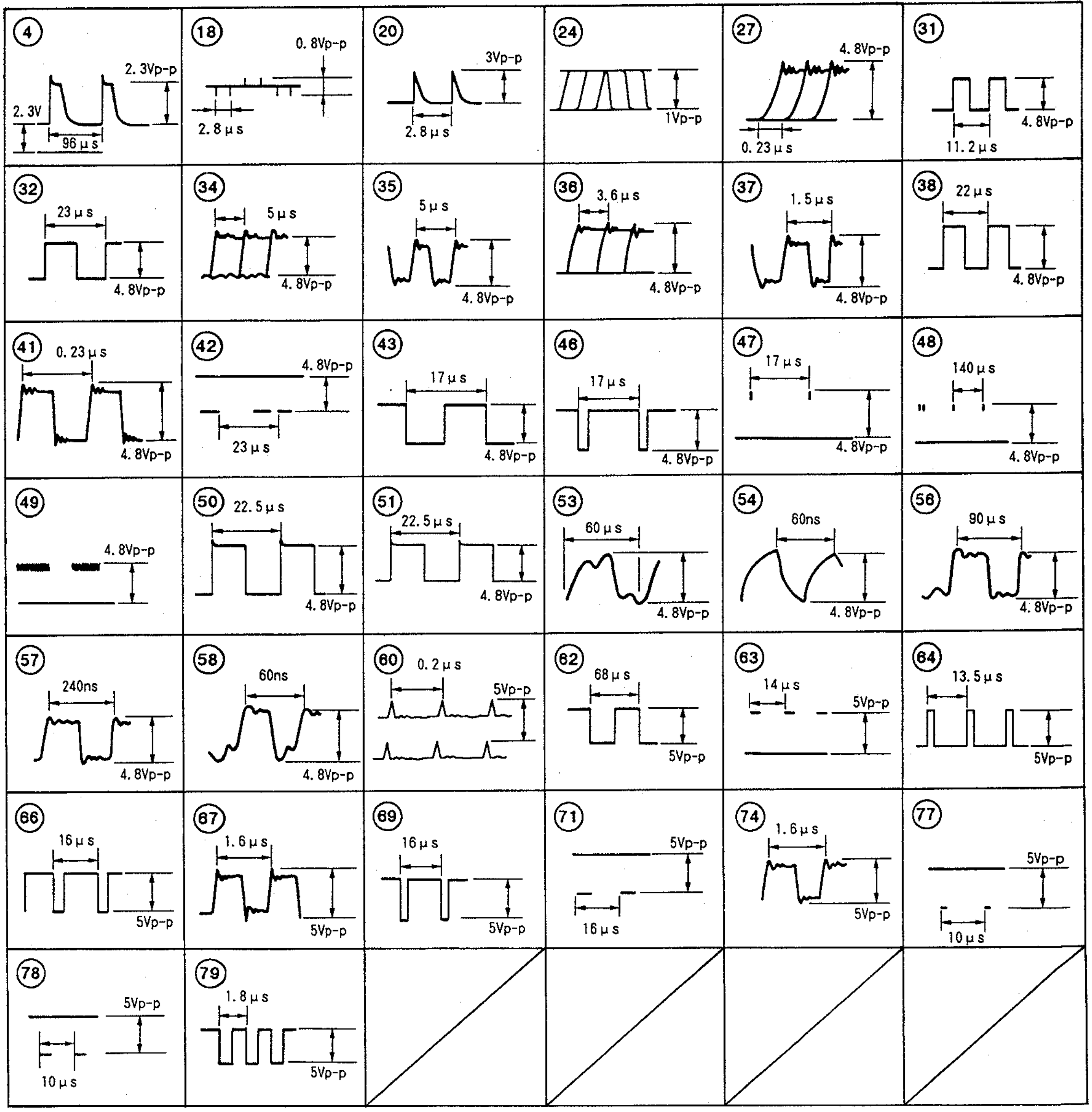
SCH-9


TO SYPS ASS'Y
CN4 (→SCH-2)
RESET
TO MAIN ASS'Y
CN101(→SCH-11)
TO RGBB ASS'Y
J101(→SCH-10)
TO RGBB ASS'Y
J102(→SCH-10)
TO RGBB ASS'Y
J103(→SCH-10)
IC301
UPD78237GC-385
MODE CONT.
LATCH
ROM
IC303
HD74HC573FP
IC302
DWM1319
R751~R758:100
IC302 :ONE TIME ROM
INV.
DIGITAL FILTER
ATTENUATE
DATA SELECTOR
EFM DECODER
IC311
CXD2500BQ
TO CONT ASS'Y
CN207(→SCH-8)
TO CONT ASS'Y
CN206(→SCH-8)
TO FTSB ASS'Y
CN806(→SCH-4)
TO CONT ASS'Y
CN205(→SCH-8)
VCA
CN309
C D A B
⇨ :RF(EFM) SIGNAL LINE
➡ :DIGITAL AUDIO (L) SIGNAL LINE

GAME PACK
KARAOKE PACK

	C	D	A	B
1	(SW) -5V	(SW) +5V	EIO 8	GND (D)
2	(SW) +5V	SEL IR IN	S OUT	X SCK
3	SEL IR OUT	EIO 7	TXD	EINT 2
4	EIO 6	EIO 5	S IN	RXD
5	EIO 4	EIO 3	EINT 1	V SYNC
6	EIO 2	EIO 1	EDA 1	EDA 0
7	EIO 0	AD 0	EAD 2	EAD 1
8	AD 1	AD 2	PACK DEF	A8
9	AD 3	AD 4	A9	A10
10	AD 5	AD 6	A11	A12
11	AD 7	ASTB	A13	A14
12	X WAIT	XRD	A15	EXO 3
13	XWR	RESET IN	EXO 2	EXO 1
14	RESET OUT	LD H SYNC	NC	LD V SYNC
15	GND (RGB)	R	X RST	ROMCS
16	GND (RGB)	G	NC	NC
17	GND (RGB)	B	NC	NC
18	GND (RGB)	F0	NC	F4
19	F1	F2	F5	F6
20	F3	GND (D)	F7	LATCH
21	MT CLK	GND (D)	SHIFT	ATT
22	BCK	GND (D)	EXCK	SBSO
23	DATA	LRCK	SCOR	WFCK
24	-8V	CD SW	C2PO	CD FADE
25	+8V	VSQ	CD SMT	G. C. SYNC
26	+5V	GND (AUD)	G. V. RESET	G. H. SYNC
27	PGM R	GND (AUD)	GND (AUD)	NC
28	PGM L	GND (AUD)	NC	NC
29	FM R	GND (AUD)	Y. COMP	ATT L
30	FM L	GND (AUD)	ATT R	MODE

IC311 (CXD2500BQ) Note : ⓃⓄ in the table correspond to the pin number.


④ 2.3Vp-p 2.3V 96μs
⑱ 0.8Vp-p 2.8μs
⑳ 3Vp-p 2.8μs
㉔ 1Vp-p
㉗ 4.8Vp-p 0.23μs
㉛ 4.8Vp-p 11.2μs
㉜ 23μs 4.8Vp-p
㉞ 5μs 4.8Vp-p
㉟ 5μs 4.8Vp-p
㊱ 3.6μs 4.8Vp-p
㊲ 1.5μs 4.8Vp-p
㊳ 22μs 4.8Vp-p
㊶ 0.23μs 4.8Vp-p
㊷ 4.8Vp-p 23μs
㊸ 17μs 4.8Vp-p
㊻ 17μs 4.8Vp-p
㊼ 17μs 4.8Vp-p
㊽ 140μs 4.8Vp-p
㊾ 4.8Vp-p
㊿ 22.5μs 4.8Vp-p
(51) 22.5μs 4.8Vp-p
(53) 60μs 4.8Vp-p
(54) 60ns 4.8Vp-p
(56) 90μs 4.8Vp-p
(57) 240ns 4.8Vp-p
(58) 60ns 4.8Vp-p
(60) 0.2μs 5Vp-p
(62) 68μs 5Vp-p
(63) 14μs 5Vp-p
(64) 13.5μs 5Vp-p
(66) 16μs 5Vp-p
(67) 1.6μs 5Vp-p
(69) 16μs 5Vp-p
(71) 5Vp-p 16μs
(74) 1.6μs 5Vp-p
(77) 5Vp-p 10μs
(78) 5Vp-p 10μs
(79) 1.8μs 5Vp-p

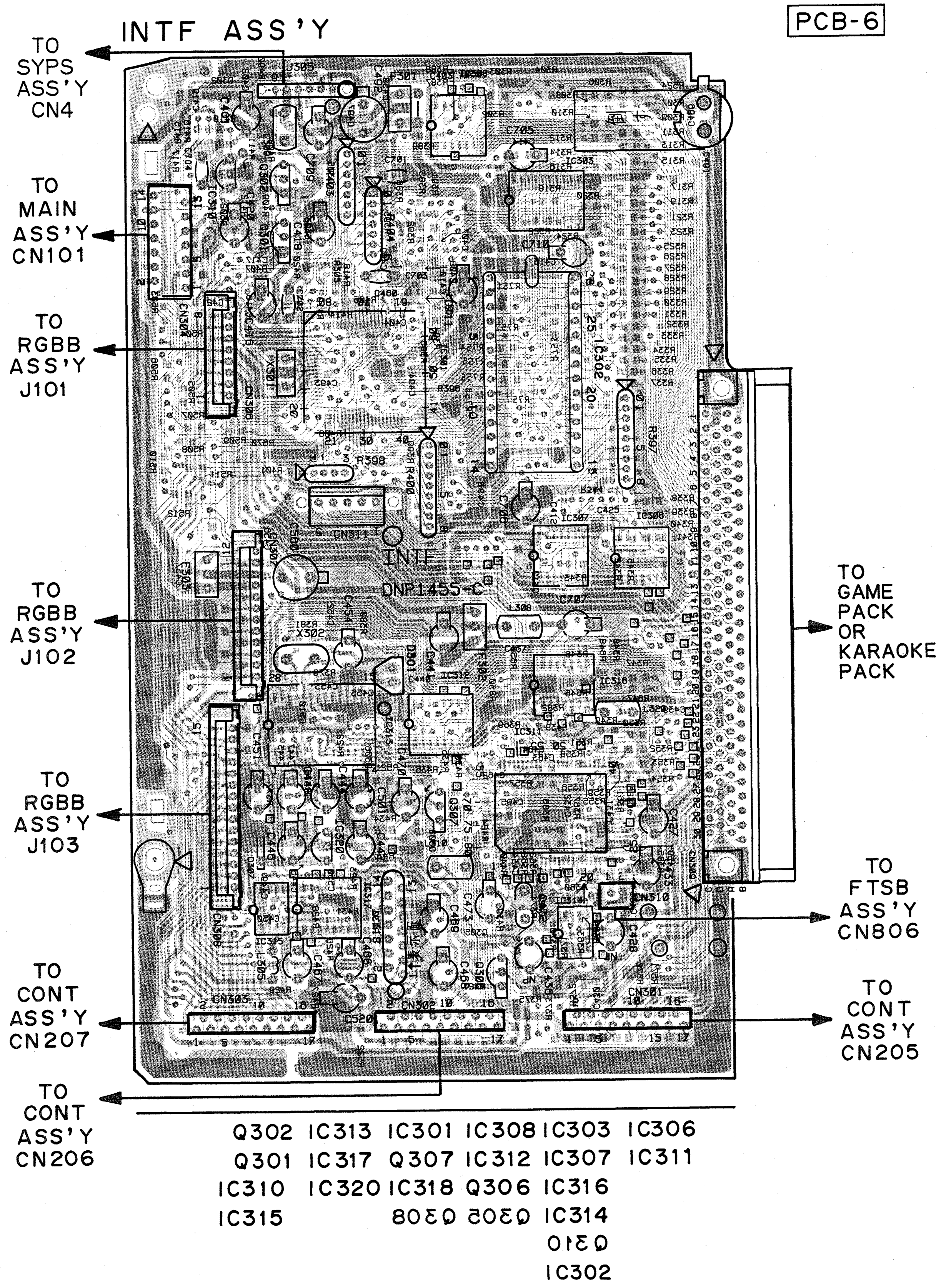
Note : These voltages are at the PLAY mode.

IC311 (CXD2500BQ)

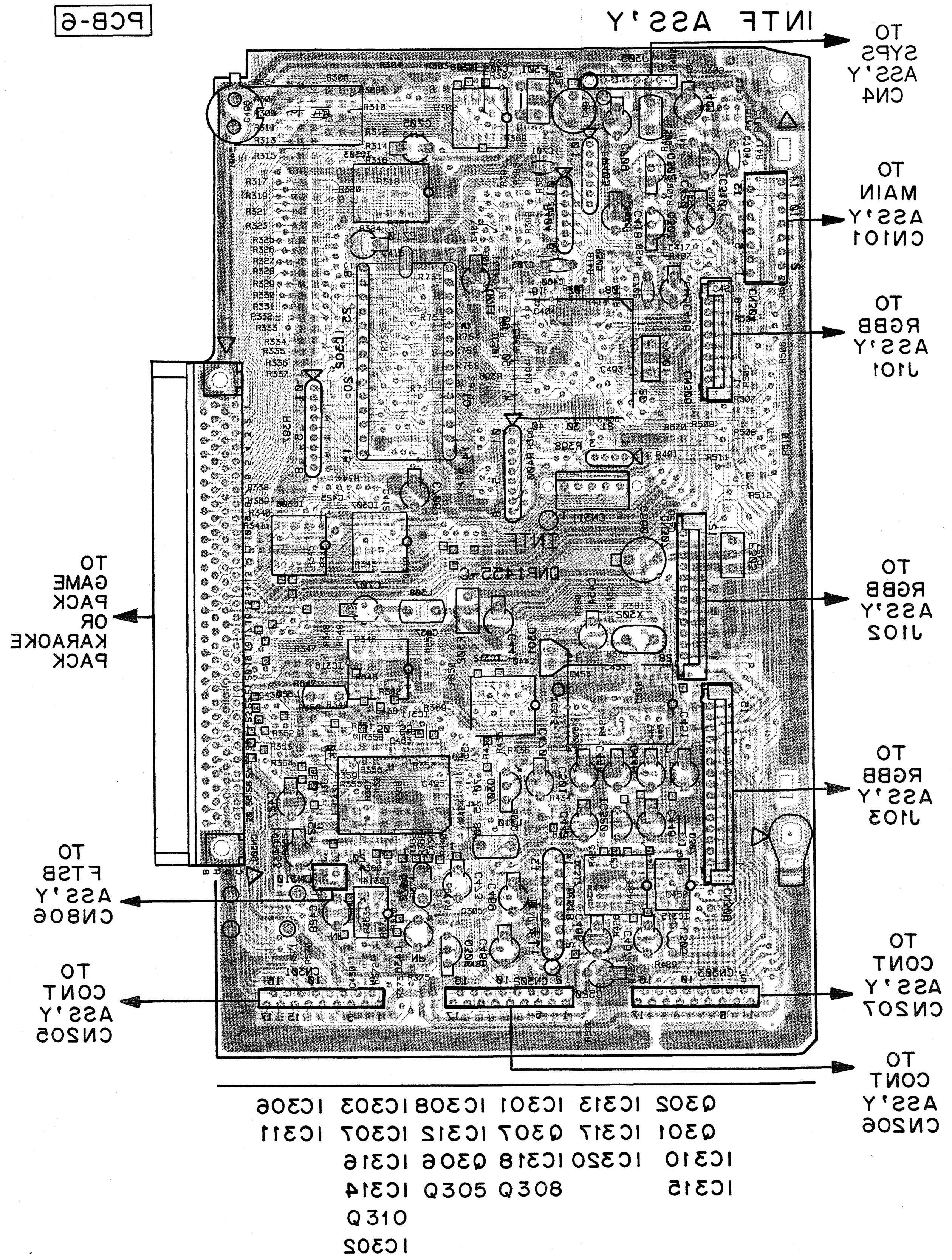
Pin No.	Voltage [V]	Pin No.	Voltage [V]	Pin No.	Voltage [V]	Pin No.	Voltage [V]	Pin No.	Voltage [V]	Pin No.	Voltage [V]
1	0	15	0	29	0	43	*	57	*	71	*
2	0	16	4.8	30	0	44	0	58	*	72	5
3	0	17	0	31	*	45	4.8	59	5	73	5
4	*	18	*	32	*	46	*	60	*	74	*
5	0	19	2.4	33	4.8	47	*	61	5	75	0
6	4.8	20	*	34	*	48	*	62	*	76	0
7	0	21	0	35	*	49	*	63	*	77	*
8	4.8	22	2.3	36	*	50	*	64	*	78	*
9	0	23	4.8	37	*	51	*	65	0	79	*
10	0	24	*	38	*	52	0	66	*	80	0
11	0	25	0	39	0	53	*	67	*		
12	0	26	0	40	4.8	54	*	68	0		
13	0	27	*	41	*	55	0	69	*		
14	0	28	0	42	*	56	*	70	5		

* : Refer to waveforms

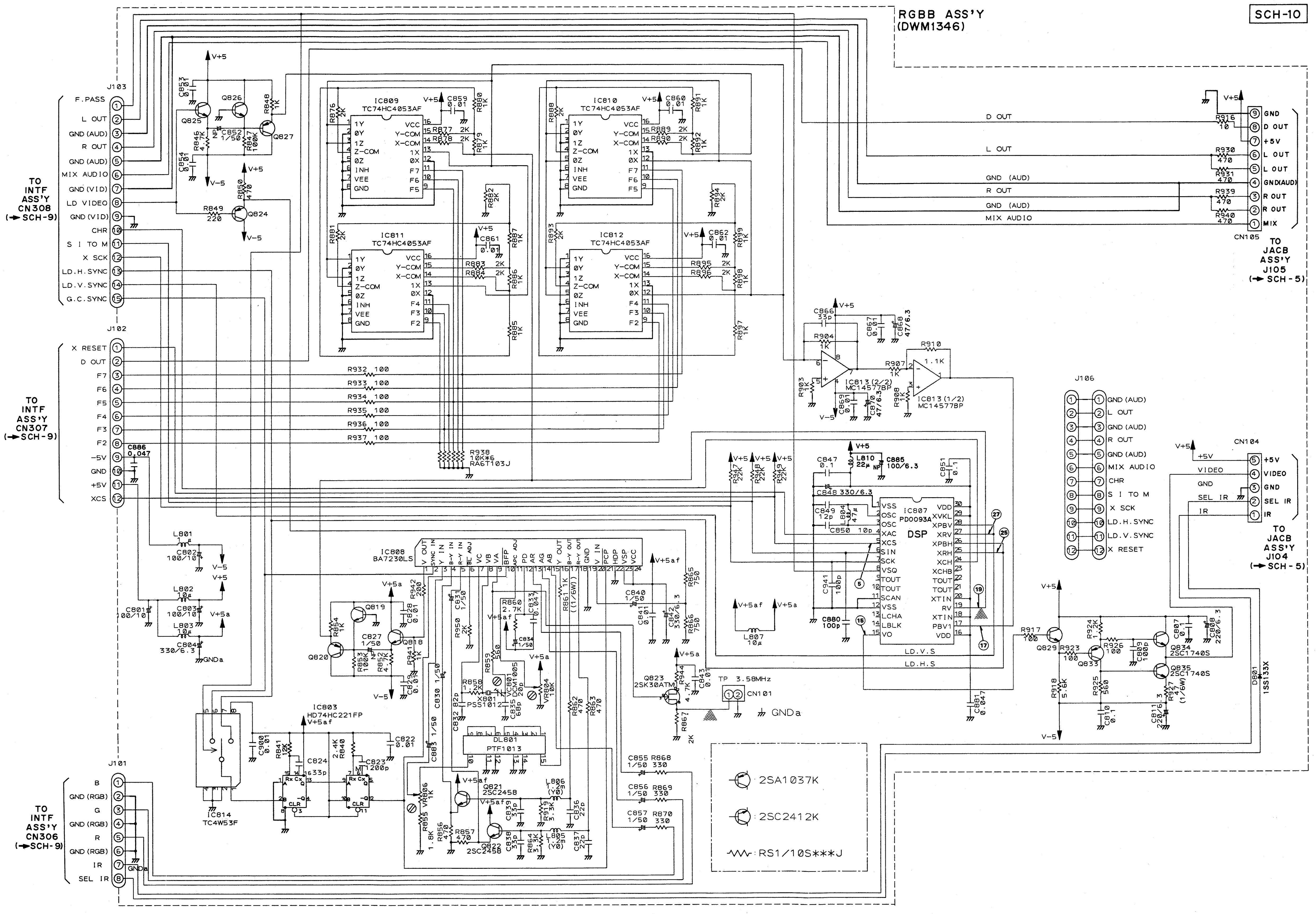
- This PCB is double sided.
- Foil pattern for each side is identified with pink and gray. Black colored parts are mounted on the pink foil side; red colored parts on the gray foil side.
- This diagram is viewed from black colored parts side.

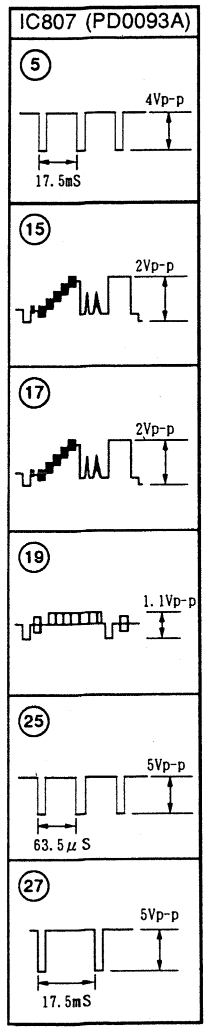

INTF ASS'Y
PCB-6
TO SYPS ASS'Y CN4
TO MAIN ASS'Y CN101
TO RGBB ASS'Y J101
TO RGBB ASS'Y J102
TO RGBB ASS'Y J103
TO CONT ASS'Y CN207
TO CONT ASS'Y CN206
TO GAME PACK OR KARAOKE PACK
TO FTSB ASS'Y CN806
TO CONT ASS'Y CN205
INTF
DNP1455-C
Q302 IC313 IC301 IC308 IC303 IC306
Q301 IC317 Q307 IC312 IC307 IC311
IC310 IC320 IC318 Q306 IC316
IC315 Q308 Q305 IC314
Q310
IC302

- This PCB is double sided.
- Foil pattern for each side is identified with pink and gray. Black colored parts are mounted on the pink foil side; red colored parts on the gray foil side.
- This diagram is viewed from red colored parts side.


INTF ASS'Y
PCB-6
TO SYPS ASS'Y CN4
TO MAIN ASS'Y CN101
TO RGBB ASS'Y J101
TO RGBB ASS'Y J102
TO RGBB ASS'Y J103
TO CONT ASS'Y CN207
TO CONT ASS'Y CN206
TO GAME PACK OR KARAOKE PACK
TO FTSB ASS'Y CN806
TO CONT ASS'Y CN205
INTF
DNP1455-C
Q302 IC313 IC301 IC308 IC303 IC306
Q301 IC317 Q307 IC312 IC307 IC311
IC310 IC320 IC318 Q306 IC316
IC315 Q308 Q305 IC314
Q310
IC302

5.10 RGBB ASS'Y

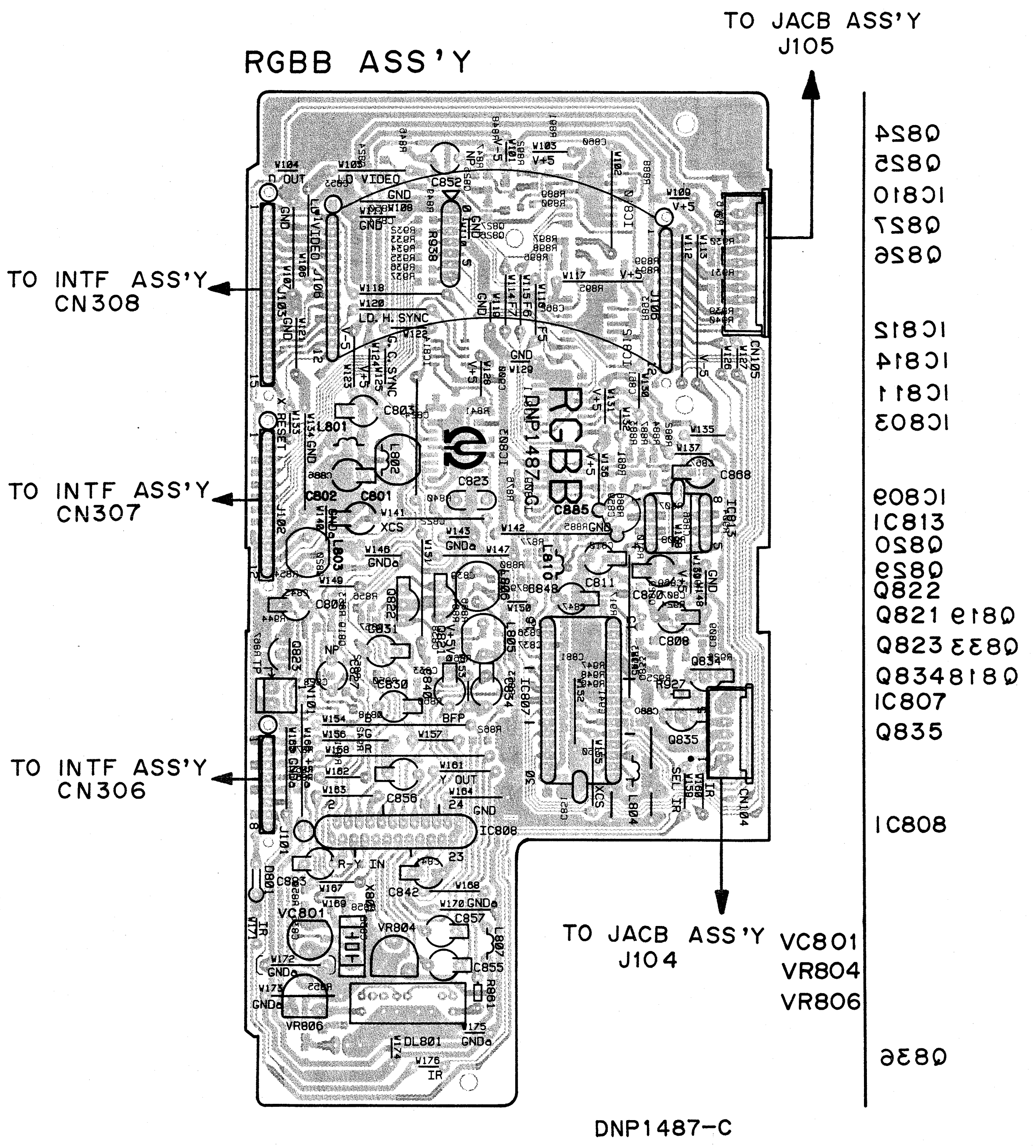

RGBB ASS'Y
(DWM1346)
SCH-10
J103
F.PASS
L OUT
GND (AUD)
R OUT
GND (AUD)
MIX AUDIO
GND (VID)
LD VIDEO
GND (VID)
CHR
S I TO M
X SCK
LD.H.SYNC
LD.V.SYNC
G.C.SYNC
TO INTF ASS'Y CN308 (→SCH-9)
J102
X RESET
D OUT
F7
F6
F5
F4
F3
F2
-5V
GND
+5V
XCS
TO INTF ASS'Y CN307 (→SCH-9)
J101
B
GND (RGB)
G
GND (RGB)
R
GND (RGB)
IR
SEL IR
TO INTF ASS'Y CN306 (→SCH-9)
Q825
Q826
Q827
Q824
R849 220
IC809 TC74HC4053AF
IC810 TC74HC4053AF
IC811 TC74HC4053AF
IC812 TC74HC4053AF
R932 100
R933 100
R934 100
R935 100
R936 100
R937 100
R938 10K×6 RA6T103J
C886 0.047
L801
L802
L803
IC808 BA7230LS
Q819
Q818
Q820
IC803 HD74HC221FP
IC814 TC4W53F
DL801 PTF1013
X801 PSS1012
Q821 2SC2458
Q822 2SC2458
Q823 2SK30ATM
TP 3.58MHz
CN101
GNDa
IC813 (2/2) MC14577BP
IC813 (1/2) MC14577BP
IC807 PD0093A DSP
L810 22μ
C885 100/6.3
C848 330/6.3
LD.V.S
LD.H.S
J106
GND (AUD)
L OUT
GND (AUD)
R OUT
GND (AUD)
MIX AUDIO
CHR
S I TO M
X SCK
LD.H.SYNC
LD.V.SYNC
X RESET
CN105
GND
D OUT
+5V
L OUT
L OUT
GND(AUD)
R OUT
R OUT
MIX
TO JACB ASS'Y J105 (→SCH-5)
CN104
+5V
VIDEO
GND
SEL IR
IR
TO JACB ASS'Y J104 (→SCH-5)
Q829
Q833
Q834 2SC1740S
Q835 2SC1740S
D801 1SS133X
2SA1037K
2SC2412K
RS1/10S✱✱✱J



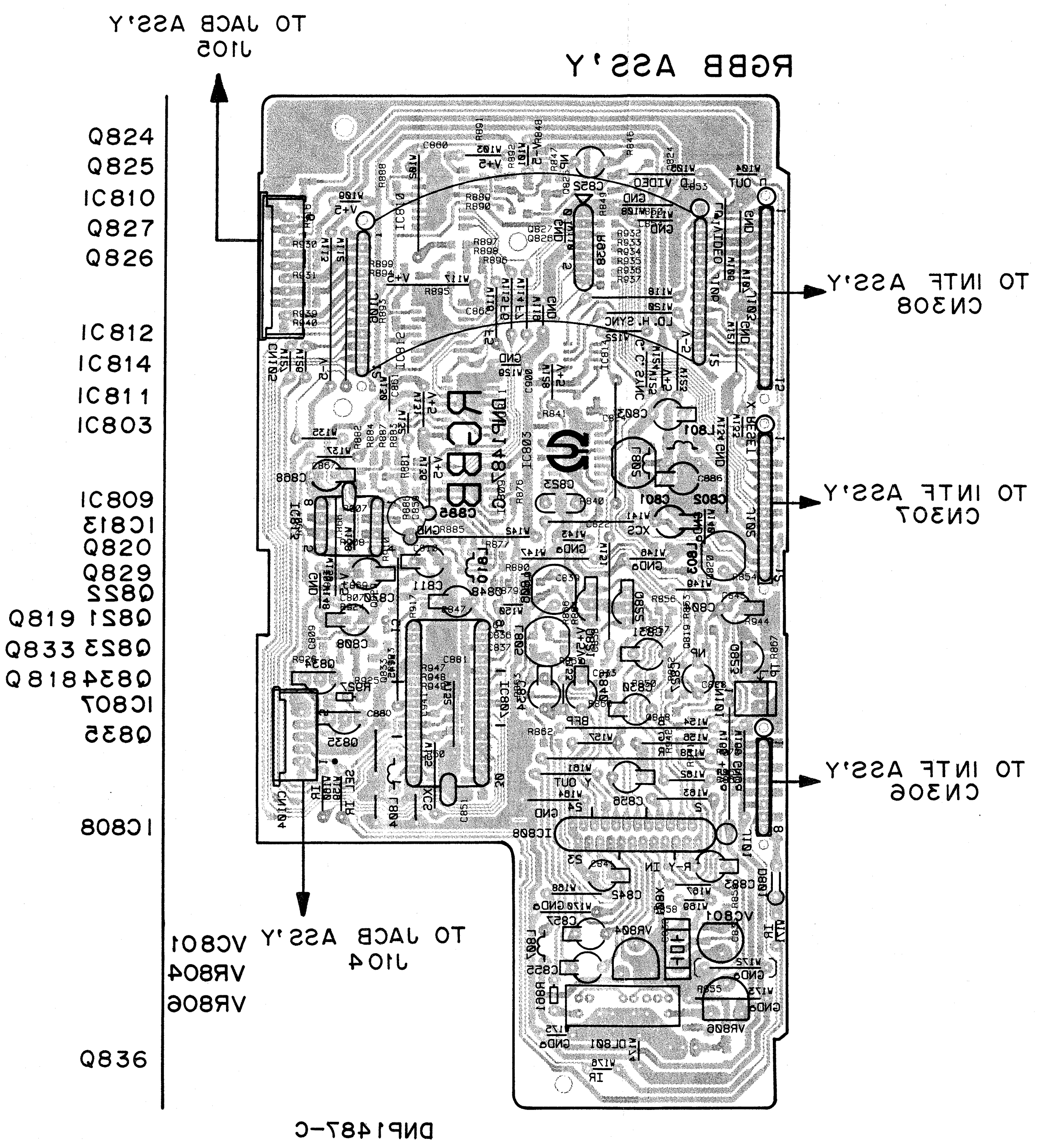
This PCB connection diagram is viewed from the parts mounted side.

This PCB connection diagram is viewed from the foil side.

PCB-7

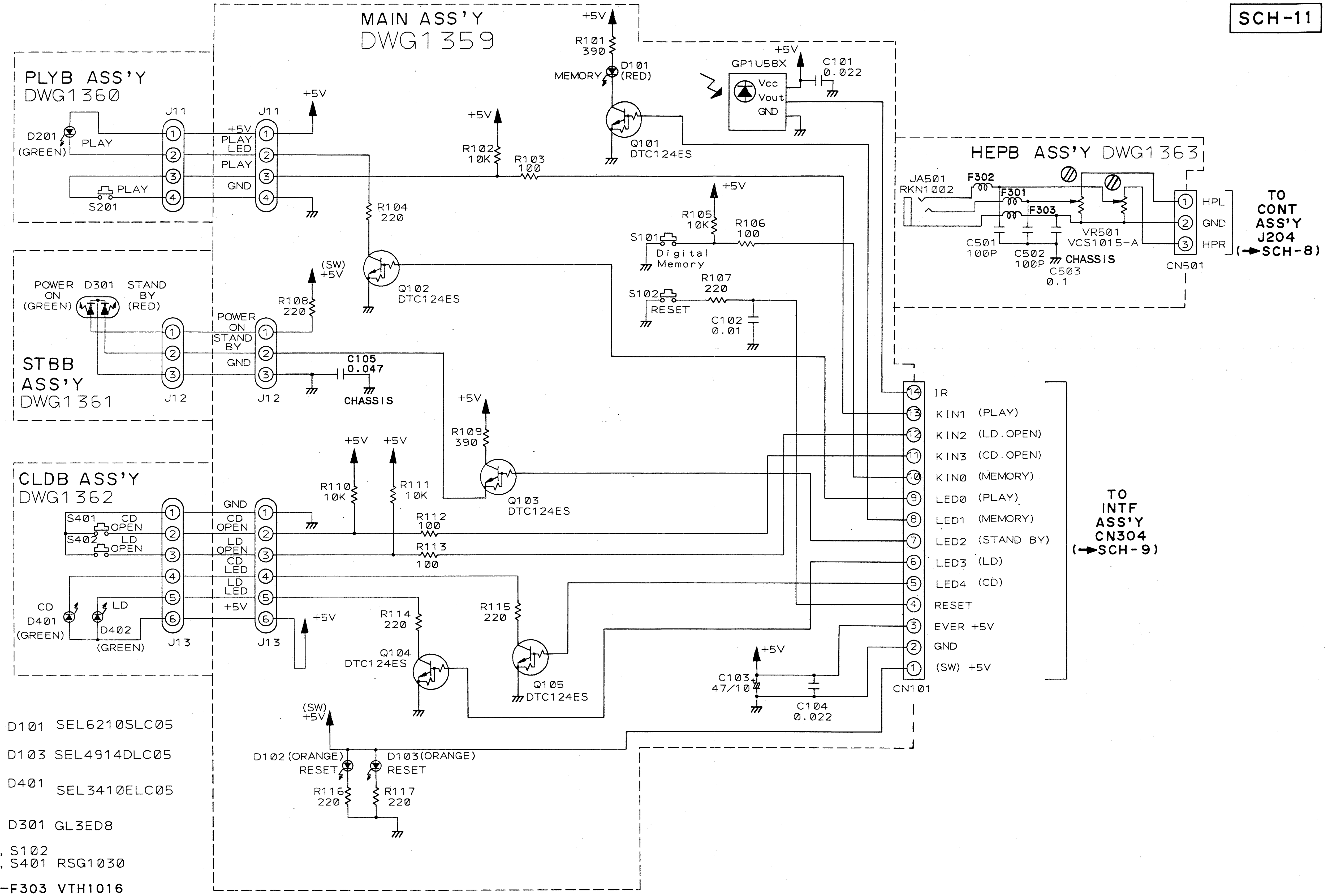

RGBB ASS'Y
TO JACB ASS'Y
J105
TO INTF ASS'Y
CN308
TO INTF ASS'Y
CN307
TO INTF ASS'Y
CN306
TO JACB ASS'Y
J104
Q824
Q825
IC810
Q827
Q826
IC812
IC814
IC811
IC803
IC809
IC813
Q820
Q829
Q822
Q821 Q819
Q823 Q833
Q834 Q818
IC807
Q835
IC808
VC801
VR804
VR806
Q836
DNP1487-C

PCB-7


RGBB ASS'Y
TO JACB ASS'Y
J105
TO INTF ASS'Y
CN308
TO INTF ASS'Y
CN307
TO INTF ASS'Y
CN306
TO JACB ASS'Y
J104
Q824
Q825
IC810
Q827
Q826
IC812
IC814
IC811
IC803
IC809
IC813
Q820
Q829
Q822
Q821 Q819
Q823 Q833
Q834 Q818
IC807
Q835
IC808
VC801
VR804
VR806
Q836
DNP1487-C

5.11 PLYB, STBB, CLDB, MAIN, HEPB ASS'Y

SCH-11


MAIN ASS'Y
DWG1359
PLYB ASS'Y
DWG1360
D201
(GREEN)
PLAY
S201
J11
+5V
PLAY LED
GND
STBB ASS'Y
DWG1361
POWER ON (GREEN)
D301
STAND BY (RED)
J12
POWER ON
STAND BY
C105
0.047
CHASSIS
CLDB ASS'Y
DWG1362
S401
CD OPEN
S402
LD OPEN
CD LED
LD LED
CD
D401
(GREEN)
LD
D402
(GREEN)
J13
R101
390
MEMORY
D101
(RED)
Q101
DTC124ES
R102
10K
R103
100
R104
220
(SW) +5V
R108
220
Q102
DTC124ES
R109
390
Q103
DTC124ES
R110
10K
R111
10K
R112
100
R113
100
R114
220
Q104
DTC124ES
R115
220
Q105
DTC124ES
D102 (ORANGE)
RESET
D103 (ORANGE)
R116
220
R117
220
GP1U58X
Vcc
Vout
GND
C101
0.022
R105
10K
R106
100
S101
Digital Memory
R107
220
S102
RESET
C102
0.01
C103
47/10
C104
0.022
HEPB ASS'Y DWG1363
JA501
RKN1002
F302
F301
F303
C501
100P
C502
100P
C503
0.1
VR501
VCS1015-A
CHASSIS
CN501
HPL
GND
HPR
TO CONT ASS'Y J204 (→SCH-8)
CN101
IR
KIN1 (PLAY)
KIN2 (LD.OPEN)
KIN3 (CD.OPEN)
KIN0 (MEMORY)
LED0 (PLAY)
LED1 (MEMORY)
LED2 (STAND BY)
LED3 (LD)
LED4 (CD)
RESET
EVER +5V
GND
(SW) +5V
TO INTF ASS'Y CN304 (→SCH-9)

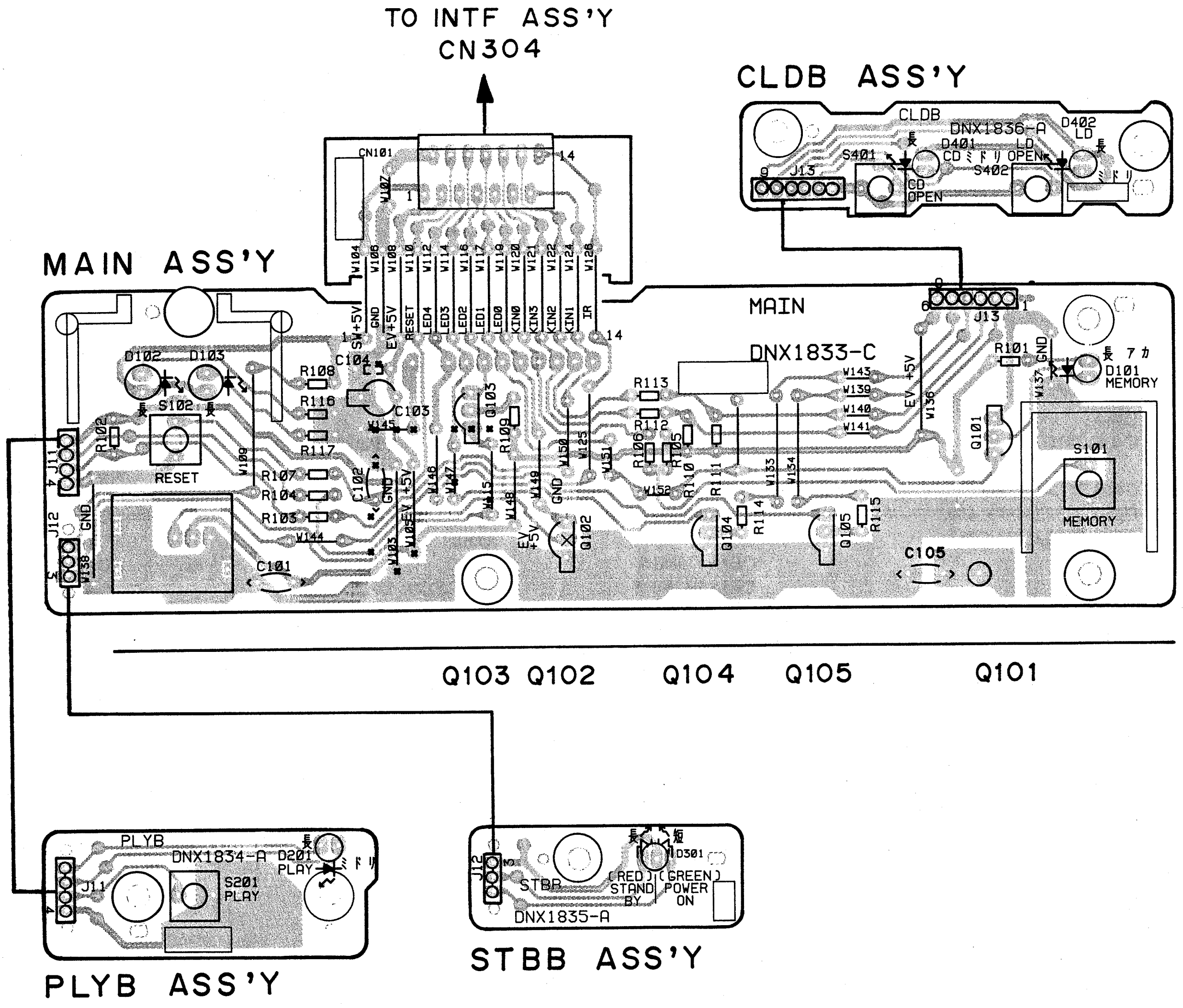
D101	SEL6210SLC05
D102, D103	SEL4914DLC05
D201, D401 D402	SEL3410ELC05
D301	GL3ED8
S101, S102 S201, S401 S402	RSG1030
F301-F303	VTH1016

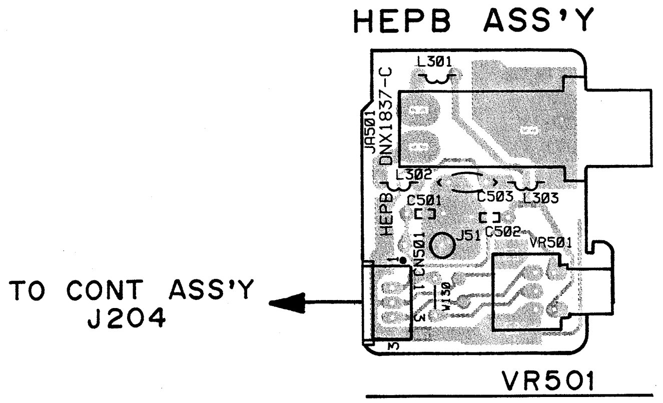
SCH-11 PLYB ASSY, STBB ASSY, CLDB ASSY, MAIN ASSY, HEPB ASSY

PLYB ASSY, STBB ASSY, CLDB ASSY, MAIN ASSY, HEPB ASSY **SCH-11**

This PCB connection diagram is viewed from the parts mounted side.

PCB-8

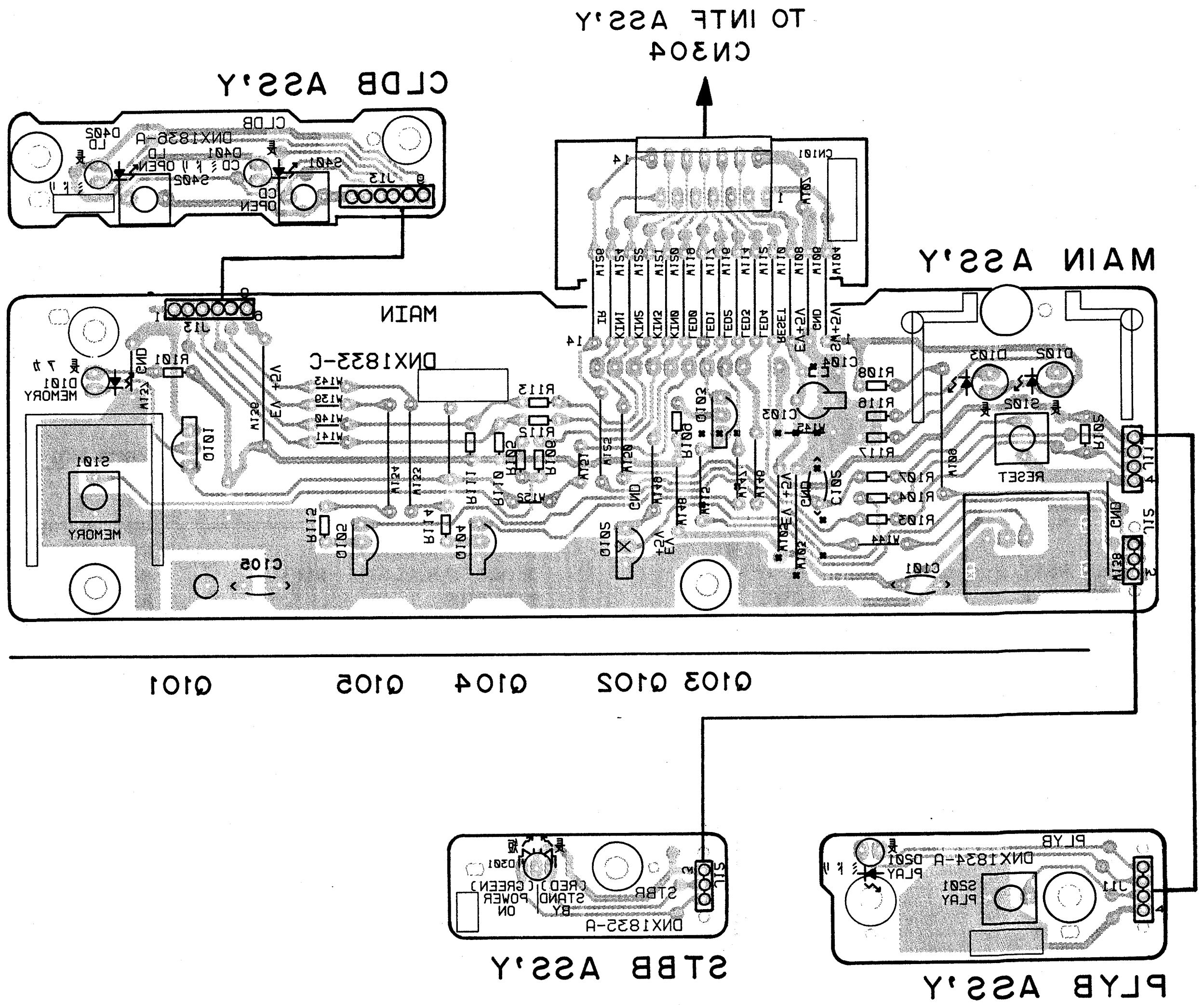

TO INTF ASS'Y
CN304
CLDB ASS'Y
CLDB
DNX1836-A
S401
S402
D401
D402
CD OPEN
J13
MAIN ASS'Y
MAIN
DNX1833-C
CN101
J11
J12
S101
MEMORY
S102
RESET
D101
D102
D103
R101
C101
C105
Q103 Q102 Q104 Q105 Q101
PLYB ASS'Y
PLYB
DNX1834-A
D201
S201
PLAY
STBB ASS'Y
STBB
DNX1835-A
D301
(RED) STAND BY
(GREEN) POWER ON

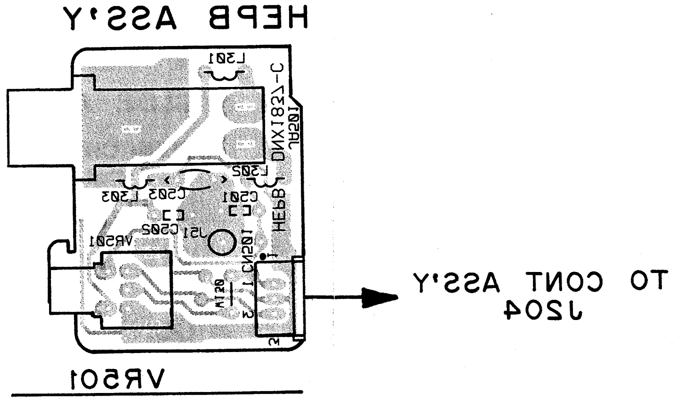

HEPB ASS'Y
HEPB
DNX1837-C
L301
L302
L303
C501
C502
C503
J51
JA501
CN501
VR501
TO CONT ASS'Y
J204

DNP1489-C

This PCB connection diagram is viewed from the foil side.

PCB-8


TO INTF ASS'Y
CN304
CLDB ASS'Y
MAIN ASS'Y
MAIN
DNX1833-C
Q103 Q102 Q104 Q105 Q101
STBB ASS'Y
PLYB ASS'Y


HEPB ASS'Y
VR501
TO CONT ASS'Y
J204

DNP1489-C

6. PCB PARTS LIST

NOTES:
- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω → 56×10^1 → 561 ·························· RD1/8PM$\boxed{5}\boxed{6}\boxed{1}$J
47kΩ → 47×10^3 → 473 ·························· RD1/4PS$\boxed{4}\boxed{7}\boxed{3}$J
0.5Ω → 0R5 ·························· RN2H$\boxed{0}\boxed{R}\boxed{5}$K
1Ω → 010 ·························· RS1P$\boxed{0}\boxed{1}\boxed{0}$K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).
5.62kΩ→ 562×10^1 → 5621 ·························· RN1/4PC$\boxed{5}\boxed{6}\boxed{2}\boxed{1}$F

LIST OF ASSEMBLIES

Mark	No.	Description	Parts No.
NSP	KEIH ASSY		DWM1343
NSP		├── MAIN ASSY	DWG1359
NSP		├── PLYB ASSY	DWG1360
NSP		├── STBB ASSY	DWG1361
NSP		├── CLDB ASSY	DWG1362
NSP		└── HEPB ASSY	DWG1363
NSP	CONT ASSY		DWM1342
		├── CONT ASSY	DWG1367
NSP		└── PWSW ASSY	DWG1368
	INTF ASSY		DWM1341
	SYPS ASSY		DWR1156
NSP	VIDEO ASSY		DWM1340
		├── VIDEO ASSY	DWV1132
NSP		└── JACB ASSY	DWX1349
NSP	MACB ASSY		DWM1344
NSP		├── FG ASSY	DWG1354
NSP		├── PKSB ASSY	DWG1355
NSP		├── CAMB ASSY	DWG1356
NSP		├── LOSB ASSY	DWG1357
NSP		└── LOMB ASSY	DWG1358
	RGBB ASSY		DWM1346
	FTSB ASSY		DWS1191

MAIN ASSY

SEMICONDUCTORS

Mark	No.	Description	Parts No.
	Q101−Q105		DTC124ES
	D102,D103		SEL4914DLC05
	D101		SEL6210SLC05

SWITCHS

Mark	No.	Description	Parts No.
	S101,S102		RSG1030

CAPACITORS

Mark	No.	Description	Parts No.
	C103		CEJA470M10
	C102		CKCYF103Z50
	C101		CKCYF223Z50
	C105		CKCYF473Z50
	C104		CKPUYF223Z25

RESISTORS

Mark	No.	Description	Parts No.
	R103,R106,R112,R113		RD1/6PM101J
	R102,R105,R110,R111		RD1/6PM103J
	R104,R107,R108,R114−R117		RD1/6PM221J
	R101,R109		RD1/6PM391J

OTHER

Mark	No.	Description	Parts No.
	CN101	AMP Connector (14P)	6−176927−4
		Cable Holder (3P)	51048−0300
		Remote sensor	GP1U58X

PLYB ASSY

SEMICONDUCTORS

Mark	No.	Description	Parts No.
	D201		SEL3410ELC05

SWITCHS

Mark	No.	Description	Parts No.
	S201		RSG1030

STBB ASSY

SEMICONDUCTORS

Mark	No.	Description	Parts No.
	D301		GL3ED8

OTHER

Mark	No.	Description	Parts No.
		Cable Holder (3P)	51048−0300

CLDB ASSY

SEMICONDUCTORS

Mark	No.	Description	Parts No.
	D401,D402		SEL3410ELC05

SWITCHS

Mark	No.	Description	Parts No.
	S401,S402		RSG1030

CONT ASSY

SEMICONDUCTORS

Mark	No.	Description	Parts No.
	IC352		M51131L
	IC408−IC411,IC453		NJM4558D
	IC201		PD0178C
	Q453,Q454		2SC1740S
	Q405,Q406		2SD2144S
	Q407,Q455		DTA124ES
	Q408,Q456		DTC124ES
	D405−D410		1SS254
	D401−D404		MTZ6.2B/C

COILS, FILTERS

Mark	No.	Description	Parts No.
	L201		LFA100J

CAPACITORS

Mark	No.	Description	Parts No.
	C204,C205		CCCCH300J50
	C485		CEALNP2R2M35
	C443		CEANP100M16
	C491		CEANP330M16
	C411		CEANP4R7M35
	C403,C406−C408		CEAS100M50
	C201		CEAS101M10
	C404		CEAS220M50
	C484		CEAS331M16
	C401,C410		CEAS470M16
	C439−C442,C469		CEJA100M16
	C450,C451,C458,C459, C462,C463,C482,C483		CEJA101M10
	C409		CEJA470M16
	C405		CEJA4R7M50
	C444−C446		CEJANP100M16
	C460,C461		CEJANP220M10
	C412		CEJANP4R7M35
	C456,C457		CFTXA102J50
	C452,C453		CFTXA152J50
	C464		CFTXA393J50
	C454,C455		CFTXA682J50
	C202,C402,C470,C492,C493		CKCYF473Z50
	C448,C449		CKPUYB681K50
	C203		CKPUYF103Z25

RESISTORS

Mark	No.	Description	Parts No.
		All resistors	RD1/6PM□□□J

OTHER

Mark	No.	Description	Parts No.
	CN205−CN207	JE Connector plug	17PS−JE
		Cable holder (3P)	51048−0300
		Cable holder (8P)	51048−0800
	J204	Flat cable (3P)	D20PYY0360E
	J201	Flat cable (10P)	D20PYY1025E
	J202,J203	Flat cable (14P)	D20PYY1425E
	J211	Flat cord (8P)	DDD1075
	J210	Flat cord (10P)	DDD1076
	J209,J212	Flat cord (14P)	DDD1077
		Screw terminal	VNE1856
	X101	Ceramic resonator (9.00MHz)	VSS1040

PWSW ASSY

SWITCHS

Mark	No.	Description	Parts No.
	S101		DSG1042

INTF ASSY

SEMICONDUCTORS

Mark	No.	Description	Parts No.
	IC311		CXD2500BQ
	IC302	MBM27C512P (ROM)	DYW1319
	IC308		HD74HC00FP
	IC307		HD74HC10FP
	IC312		HD74HC157FP
	IC317		HD74HC4053FP
	IC303		HD74HC573FP
	IC306		HD74HC74FP
	IC313		LC7883KM
	IC318		M51131L
	IC314,IC315		NJM4558M
	IC320		NJM78L05A
	IC310		PST529C
	IC316		TC74HCU04AF
	IC301	UPD78237GC−3B9	GGC1026
	Q305,Q308		2SC2412K
	Q302,Q306,Q307		DTA144ES
	Q301		DTC114ES
	Q310		DTC124EK
	D302,D303,D305,D306		DAN202K
	D307		ERA83−006
	D301		FC54M

COILS, FILTERS

Mark	No.	Description	Parts No.
	L305		LAU010K
	L320		LFA010J
	L308−L310		LFA2R2J
	F301−F303		DTH1157

CAPACITORS

Mark	No.	Description	Parts No.
	C510		CCSQCH100D50
	C404−C411,C462,C463		CCSQCH101J50
	C438		CCSQCH120J50
	C439		CCSQCH360J50
	C418		CEAL100M16
	C453		CCSQCH220J50
	C401,C416,C433		CEAL101M6R3
	C520		CEAL470M10
	C444,C446,C448,C451		CEAL470M6R3
	C428		CEALNPR47M50
	C436		CEANPR47M50
	C466,C467,C501		CEAS100M16
	C705−C707,C710,C711		CEAS101M6R3
	C473		CEAS220M25
	C427,C441		CEAS221M6R3
	C560,C709		CEAS331M6R3
	C442,C454,C470		CEAS470M10
	C492		CEAS471M6R3
	C469		CEJA220M16
	C468		CEJA470M10
	C420		CEJA4R7M50
	C701−C704		CGCYX104M25
	C434		CK SQYB152K50
	C419		CK SQYF102Z50
	C431,C440,C445,C452,C455,C464		CK SQYF103Z50

Mark	No.	Description	Parts No.
	C402,C413,C426,C429,C430,C435,C443, C447,C449,C450,C458,C498		CKSQYF104Z50
	C403,C412,C414,C415,C417,C421,C425, C437,C456,C457,C460,C493−C497, C550		CKSQYF223Z50
	C432,C459		CKSQYF473Z50
	C472		CQMA223J50
	C491	(1200, 6.3V)	DCH1055

RESISTORS

Mark	No.	Description	Parts No.
	R398	(22K,1W)	RA3T223J
	R403	(22K,1W)	RA6T223J
	R404	(220K)	RA6T224J
	R397,R400	(22K, 1/10W)	RA8T223J
		Other resistors	RS1/10S□□□J

OTHER

Mark	No.	Description	Parts No.
	CN301−CN303	JE Connector Socket	17R−JE
	CN304	AMP Connector (14P)	6−176746−4
	CN310	KR Connector	B2B−PH−K
	CN311	5P Top post (NH)	B5P−SHF
	CN309	Half Pitch Connector (120P)	DKN1097
		Cable Holder (6P)	51048−0600
	J305	Flat cable (6P)	D20PYY0620E
		Earth plate	DNF1446
		IC Socket (28P)	VKH1001
	X301	Ceramic resonator (12.00MHz)	DSS1039
	X302	Crystal oscillator (16MHz)	VSS1051

SYPS ASSY

SEMICONDUCTORS

Mark	No.	Description	Parts No.
	IC101,IC102		ICP−N15
	IC201		ICP−N25
	IC202,IC301		ICP−N50
	IC203		UPC1093J
	Q301		2SA1015
	Q201,Q302		2SA1307
	Q101,Q102		2SB1185
	Q202		2SC1815
	Q2,Q3		2SC2655
	Q1		2SC4275
	Q103,Q104		2SD1762
	D4,D5		1SS178TPA
	D1		D2SB40−4001
	D104−D107		ERA91−02V
	D3		ERB44−02V
	D2		ERB44−04V
	D301		ERB83−004
	D101,D102		ERC91−02L
	D201		ESAB82M
	D6		PS2501
	D302		RD5.6ES

VIDEO ASSY

SEMICONDUCTORS

Mark	No.	Description	Parts No.
	IC815		BA10393N
	IC801		BA15218N
	IC1		CA0002AM
	IC666		HD74HC221P
	IC603		MB40568P
	IC605		MB40778
	IC301		MC141621FU
	IC901		MM1109XS
	IC604		MN4700
	IC602		MN4760S
	IC607,IC609		NJM082S
	IC611		NJM4558D
	IC612		NJM4558S
	IC606		PA4016
	IC401		PA5013A
	IC601		PDB011
	IC608,IC817,IC818		TC4S66F
	IC403,IC816		TC4W53F
	IC804		TC5081AP
	IC820		TC74HC123AP
	IC802		TC74HC4053AP
	IC613		TC7WU04F
	IC610		VTX1001
	Q211,Q218,Q301,Q303,Q305,Q314, Q417,Q430,Q431,Q605,Q618,Q621, Q631,Q644,Q645,Q701,Q703,Q813, Q823,Q902		2SA1037K
	Q626,Q628,Q633		2SA933S
	Q312		2SB1237X
	Q625,Q627		2SC1740S
	Q1,Q2,Q209,Q210,Q212,Q216,Q217, Q219,Q302,Q306,Q317,Q401,Q402, Q406,Q409,Q424,Q432,Q601−Q603, Q606,Q607,Q610,Q611,Q615,Q616, Q622,Q624,Q630,Q636,Q643,Q702, Q814,Q815,Q821,Q822,Q900,Q901,Q903		2SC2412K
	Q315		2SD1858X
	Q316,Q407,Q408,Q612,Q614,Q617, Q818		DTA124EK
	Q313,Q422,Q423,Q604,Q608,Q609, Q613,Q619,Q816,Q817		DTC124EK
	D601		1S2339
	D301,D302		1S2471
	D602−D604,D607−D612		1SS254
	D802		FC54M/456

COILS, FILTERS

Mark	No.	Description	Parts No.
	L429,L430,L606		LAU100J
	L406,L407,L415,L601,L611, L625,L626,L900		LAU120J
	L422		LAU121J
	L607		LAU150J
	L302		LAU180J

Mark	No.	Description	Parts No.
	L201 — L204,L301,L305,L306, L404,L405,L417,L602,L612, L619		LAU220J
	L3,L303,L608		LAU270J
	L610,L613,L617,L618,L620		LAU2R2M
	L403,L633		LAU330J
	L411,L426,L428,L603,L605		LAU390J
	L622		LAU3R3J
	L409		LAU430J
	L427,L604		LAU470J
	L1,L2,L408,L416		LAU560J
	L401		LAU5R6J
	L410		LAU620J
	L304,L634		LFA220J
	L418		LFA561J
	F2	(2.3MHz)	VTF1048
	F1	(2.8MHz)	VTF1049

CAPACITORS

Mark	No.	Description	Parts No.
	VC901		VCM1005
	C605		CCCCH181J50
	C604		CCCCH221J50
	C726		CCCSL331J50
	C622		CCPUSL560J50
	C514,C616		CCSQCH030C50
	C411,C512,C516,C615,C617, C683,C684		CCSQCH050C50
	C226,C242		CCSQCH060D50
	C302,C440		CCSQCH070D50
	C730,C731		CCSQCH080D50
	C409,C436,C817		CCSQCH100D50
	C477		CCSQCH101J50
	C303,C305,C422		CCSQCH120J50
	C222,C238,C488,C517,C611, C883		CCSQCH150J50
	C301,C407,C468,C475,C476		CCSQCH151J50
	C511,C614,C790		CCSQCH180J50
	C900		CCSQCH181J50
	C418,C419		CCSQCH200J50
	C224,C227,C240,C243,C736		CCSQCH220J50
	C2,C408,C466,C495		CCSQCH221J50
	C437,C708		CCSQCH270J50
	C442		CCSQCH271J50
	C410,C432		CCSQCH330J50
	C304,C306,C424,C439,C463		CCSQCH390J50
	C223,C239,C405,C406,C412, C420,C438,C453,C612,C613		CCSQCH470J50
	C225,C241,C513,C515		CCSQCH560J50
	C1,C4		CCSQCH910J50
	C906,C909		CCSQSL561J50
	C903,C904		CCSQSL681J50
	C620,C707		CEAL010M50
	C914, C922		CEAL101M6R3

Mark	No.	Description	Parts No.
	C626		CEAL220M16
	C905		CEAL470M6R3
	C637,C811		CEANP010M50
	C619,C664		CEANP4R7M35
	C665		CEANPR47M50
	C435,C688,C910		CEAS010M50
	C462,C653		CEAS100M50
	C7,C218,C219,C234,C235,C254, C255,C310,C313,C315,C316,C320, C327,C602,C608,C634,C642,C655, C678,C679,C681,C682,C685,C687, C689,C700,C709		CEAS101M10
	C648		CEAS220M16
	C668		CEAS220M25
	C323		CEAS221M6R3
	C908		CEAS3R3M50
	C3,C12,C17,C417,C426,C428,C434, C455,C456,C461,C472,C490,C492, C641,C658,C660,C663,C680,C713, C722,C825,C885,C891		CEAS470M10
	C332,C334,C464,C607,C913		CEAS471M6R3
	C16		CEJA100M16
	C819,C821		CEJA101M10
	C14		CEJANP010M50
	C23		CEJAR47M50
	C431,C625,C666		CFTXA103J50
	C15,C458		CFTXA104J50
	C886		CFTXA124J50
	C826		CFTXA222J50
	C618		CFTXA223J50
	C10,C20		CFTXA224J50
	C469,C667,C674,C676		CFTXA473J50
	C459,C460,C706,C742		CFTXA683J50
	C480,C649,C715,C723		CFTYA184J50
	C621		CKCYB102K50
	C920		CKCYF473Z50
	C901		CKPUYB101K50
	C650		CKPUYB181K50
	C632		CKPUYB331K50
	C467,C471		CKPUYB910K50
	C441,C712		CKPUYF103Z25
	C331,C333,C518,C519,C609,C610		CKSQYB102K50
	C644,C645,C797		CKSQYB222K50
	C907		CKSQYB392K50
	C324		CKSQYB472K50
	C911		CKSQYB682K50
	C5,C217,C220,C233,C236,C253, C256,C314,C317,C321,C326,C335, C415,C416,C421,C423,C425,C433, C443,C454,C457,C465,C473,C474, C489,C491,C623,C624,C629,C630, C640,C646,C651,C654,C659,C661, C672,C673,C686,C691,C694,C697, C702,C714,C721,C791,C794,C795, C812,C813,C818,C820,C858,C882, C884,C887,C902,C912		CKSQYF103Z50

Mark	No.	Description	Parts No.
	C6,C13,C18,C311,C312,C325,C328, C329,C340,C638,C657,C716,C720, C745,C799,C802,C803,C881		CKSQYF104Z25
	C307		CKSQYF223Z50
	C24,C725,C737−C740,C792,C793		CKSQYF473Z25
	C627,C633,C669,C733		CQMA102J50
	C921		CQMA124J50
	C892		CQMA222J50
	C429		CQMA272J50
	C705		CQMA332J50
	C11,C22		CQMA393J50
	C8,C9,C19,C21,C635		CQMA472J50
	C670		CQMA682J50
	C606		CQMA821J50

RESISTORS

Mark	No.	Description	Parts No.
	VR482	(2.2K)	VRTB6VS222
	VR802,VR808	(22k)	VRTB6VS223
	VR201,VR202		VRTB6VS332
	VR521,VR807	(4.7K)	VRTB6VS472
	VR401		VRTG6VS221
	R8,R9,R617,R619,R663		RD1/6PM102J
	R671,R779,R796		RD1/6PM103J
	R759,R845		RD1/6PM104J
	R623		RD1/6PM124J
	R704−R711		RD1/6PM181J
	R620		RD1/6PM220J
	R471,R743		RD1/6PM221J
	R453,R602,R747		RD1/6PM222J
	R601,R828		RD1/6PM332J
	R317,R728,R925		RD1/6PM472J
	R638		RD1/6PM473J
	R408		RD1/6PM680J
	R1,R606,R612		RD1/6PM681J
	R311		RD1/6PM682J
	R688		RD1/6PM822J
	R450		RD1/6PM911J
	R699,R701		RN1/6PQ1002F
	R413		RN1/6PQ1203F
	R833		RN1/6PQ1801F
	R429		RN1/6PQ2002F
	R831		RN1/6PQ2201F
	R698,R700		RN1/6PQ2202F
	R405,R406		RN1/6PQ2402F
	R835		RN1/6PQ4701F
	R412		RN1/6PQ5101F
		Other resistors	RS1/10S□□□J

OTHER

Mark	No.	Description	Parts No.
	TC401	Ceramic Trimmer	VCM−006
		HOUSING ASS'Y(2P)	DKP2626
	X602	Crystal resonator (18.1MHz)	DSS1035
	X601	Crystal resonator (14.318MHz)	VSS1044
		PCB Binder	VEF1040

JACB ASSY

COILS, FILTERS

Mark	No.	Description	Parts No.
	L101		LAU101J

CAPACITORS

Mark	No.	Description	Parts No.
	C106,C107		CCSQCH101J50
	C101		CEAS221M6R3
	C113		CKSQYF103Z50
	C102,C104,C105,C111		CKSQYF104Z25

RESISTORS

Mark	No.	Description	Parts No.
	R101,R102		RD1/6PM750J
		Other resistors	RS1/10S□□□J

OTHER

Mark	No.	Description	Parts No.
	JA102	Pin jack (4P)	DKB1038
	JA101	Optical output module	GP1F32T
	JA104	Pin jack (Video)	VKB−014
	JA103	Pin jack (RF)	VKB1029
	JA105	Mini jack (2P)	VKN−183
		Cable Holder (3P)	51048−0300
		Shield plate	DNH1842

FG ASSY

SEMICONDUCTORS

Mark	No.	Description	Parts No.
	D1		GP1S51V

OTHER

Mark	No.	Description	Parts No.
	64	HOUSING ASS'Y	VKP1950

PKSB ASSY

SWITCHS

Mark	No.	Description	Parts No.
	S4,S5		DSG1015

OTHER

Mark	No.	Description	Parts No.
	72	HOUSING ASS'Y	VKP1951

CAMB ASSY

SEMICONDUCTORS

Mark	No.	Description	Parts No.
	Q10		2SC1740S

CAPACITORS

Mark	No.	Description	Parts No.
	C12,C13		CEAS220M25
	C10,C11		CKCYF103Z50

RESISTORS

Mark	No.	Description	Parts No.
	R10		RD1/6PM182J
	R11		RD1/6PM470J

OTHER

Mark	No.	Description	Parts No.
	CN404	Connector	B3B−PH−K−S
	CN402	Connector	B3B−PH−K−R
	CN403	Connector (23P)	HLEM23R−1
	CN401	Connector (23P)	VKN1073
		HOUSING ASS'Y	DKP2783

LOSB ASSY

SWITCHS

Mark	No.	Description	Parts No.
	S1 − S3		DSG1015

LOMB ASSY

CAPACITORS

Mark	No.	Description	Parts No.
	C1		CGCYX473M25

HEPB ASSY

COILS, FILTERS

Mark	No.	Description	Parts No.
	F301 − F303		VTH1016

CAPACITORS

Mark	No.	Description	Parts No.
	C503		CGCYX104M25
	C501,C502		CKPUYB101K50

RESISTORS

Mark	No.	Description	Parts No.
	VR501	(0.5K)	VCS1015

OTHER

Mark	No.	Description	Parts No.
	CN501	Jamper connector (2MMP)	52151 − 0310
	JA501	Headphone Jack	RKN1002
	J13	Flat cable (6P)	D20PWW0625E
	J11	Flat cable (4P)	D20PWY0415E
	J12	Flat cable (3P)	D20PYY0320E

RGBB ASSY

SEMICONDUCTORS

Mark	No.	Description	Parts No.
	IC808		BA7230LS
	IC803		HD74HC221FP
	IC813		MC14577BP
	IC807		PD0093A
	IC814		TC4W53F
	IC809 − IC812		TC74HC4053AF
	Q820,Q824,Q827,Q833		2SA1037K
	Q834,Q835		2SC1740S
	Q818,Q819,Q825,Q826,Q829		2SC2412K
	Q821,Q822		2SC2458
	Q823		2SK30ATM
	D801		1SS133X

COILS, FILTERS

Mark	No.	Description	Parts No.
	L801		LAU010K
	L807		LAU100J
	L810		LAU220J
	L804		LAU470J
	L802,L803		LFA100J
	L805,L806		LFA122J

CAPACITORS

Mark	No.	Description	Parts No.
	VC801		DCM1005
	C850		CCSQCH100D50
	C809,C880,C941		CCSQCH101J50
	C849		CCSQCH120J50
	C836,C837		CCSQCH220J50
	C824,C838,C839,C866		CCSQCH330J50
	C835		CCSQCH680J50
	C832		CCSQCH820J50
	C885		CEAL101M6R3
	C868,C870		CEAL470M6R3
	C852		CEANP010M50
	C883		CEAS010M50
	C808,C811		CEAS221M6R3
	C804,C842,C848		CEAS331M6R3
	C830,C831,C834,C840,C855 − C857		CEJA010M50
	C801 − C803		CEJA101M10
	C827		CEJANP010M50
	C822,C828,C829,C841,C843, C853,C854,C859 − C862,C867, C869,C900		CKSQYF103Z50
	C807,C810,C847,C851		CKSQYF104Z25
	C833,C881,C886		CKSQYF473Z50
	C823		CQMA122J50

RESISTORS

Mark	No.	Description	Parts No.
	VR806	(1K)	VRTB6VS102
	VR804	(10K)	VRTB6VS103
	R938	(10K)	RA6T103J
	R861		RD1/6PM102J
	R927		RD1/6PM470J
		Other resistors	RS1/10S□□□J

OTHER

Mark	No.	Description	Parts No.
		Cable Holder (8P)	51048 − 0800
		Cable Holder (12P)	51048 − 1200
	J103	Flat cord (15P)	D20PYY1510E
	X801	Crystal oscillator (3.579545MHz)	PSS1012
	DL801	Delay line	PTF1013
		PCB Binder	VEF1040

FTSB ASSY

SEMICONDUCTORS

Mark	No.	Description	Parts No.
	IC802		BA15218N
	IC801		CXA1081S
	IC810,IC811		ICP − N10
	IC804		LA6510
	IC501		NJM072L
	IC803		PM3003A
	IC805		TC4W53F
	Q105,Q106,Q806,Q808,Q812, Q819,Q832,Q836		2SA1037K
	Q503		2SA1399
	Q402,Q816,Q818		2SB1185
	Q802 − Q805,Q807,Q809,Q810, Q814,Q825,Q838		2SC2412K
	Q401,Q815,Q817		2SD1762
	Q821		2SK184
	Q820,Q824,Q826,Q829,Q830		DTA124EK
	Q107,Q811,Q823,Q827,Q828, Q835,Q837,Q839,Q841		DTC124EK
	D501,D502,D801,D804 − D808		1SS254
	D401,D402		MTZ9.1C

Mark	No.	Description	Parts No.
COILS, FILTERS			
	L801,L803		LAU151J
	L802		LAU181J
CAPACITORS			
	C837,C871		CCCSL331J50
	C817		CCSQCH050C50
	C895		CCSQCH100D50
	C810,C811,C822		CCSQCH101J50
	C806,C812,C815		CCSQCH270J50
	C804,C890,C891,C893		CCSQCH470J50
	C809,C813		CCSQCH680J50
	C818		CCSQSL471J50
	C819		CCSQSL561J50
	C808,C823		CEAL010M50
	C896		CEAL470M16
	C814,C845		CEANP010M50
	C915		CEANP100M16
	C850		CEANP2R2M50
	C870		CEANP470M10
	C866		CEANPR47M50
	C816		CEAS010M50
	C864		CEAS100M50
	C512		CEAS101M10
	C515,C876,C877		CEAS220M50
	C405,C406,C857,C859		CEAS221M10
	C401,C402,C941,C942		CEAS221M16
	C897		CEAS470M10
	C550,C551		CEAS470M16
	C840		CEHAQ010M50
	C835,C836		CEHAQ220M50
	C855		CEJA100M50
	C842,C863		CEJANP100M16
	C849,C873		CFTXA103J50
	C504,C505,C832,C838,C874		CFTXA104J50
	C807		CFTXA124J50
	C843		CFTXA223J50
	C827,C848,C867		CFTXA333J50
	C869,C910		CFTXA473J50
	C847,C868		CFTXA683J50
	C883		CFTXA823J50
	C852,C900		CFTYA224J50
	C403,C404,C407,C408		CGCYX473M25
	C854		CKPUYB821K50
	C513		CKSQYB102K50
	C879		CKSQYB562K50
	C501,C503,C511,C801−C803, C824,C828,C829,C875		CKSQYF103Z50
	C510,C851,C858,C860, C880−C882		CKSQYF104Z25
	C805,C820,C878		CKSQYF473Z25
	C931		CKSQYF473Z50
	C839		CQMA102J50
	C834		CQMA152J50
	C899		CQMA272J50
	C853		CQMA332J50

Mark	No.	Description	Parts No.
	C502		CQMA333J50
	C898		CQMA472J50
	C825		CQMA682J50
RESISTORS			
	VR603,VR609	(10K)	VRTB6VS103
	VR620	(15K)	VRTB6VS153
	VR601,VR605,VR606,VR611	(2.2K)	VRTB6VS222
	VR604	(4.7K)	VRTB6VS472
	VR610		VRTB6VS473
	R913		RD1/6PM101J
	R962		RD1/6PM102J
	R923		RD1/6PM103J
	R917		RD1/6PM123J
	R507		RD1/6PM225J
	R402,R406		RD1/6PM331J
	R528,R529,R976		RD1/6PM470J
	R841,R910−R912		RD1/6PM563J
	R934		RD1/6PM681J
	R850,R862 (3.3)		RS1LMF3R3J
		Other resistors	RS1/10S□□□J
OTHER			
	CN807	Top post (11P)	B11P−SHF−1AA
	CN806	Connector	B2B−PH−K
	CN803	Connector (23P)	VKN1013
	J801	Flat cable (11P)	D20PYY1130G
		PCB Binder	VEF1040

7. ADJUSTMENTS

7.1 TEST MODE

1) Test mode startup
   With the CONT assembly's IC201 (PD0178) pin25 (SHAKE) connect to GND, turn ON the power switch to start up the test mode.
   Use a screwdriver to short circuit the two points on the copper pattern side shown in Fig.1 and turn ON the power switch. This will make the operation easier. or, turn ON the power switch and then press the ESC key and TEST key (in this order) on the test mode remote controller (GGF1067).

2) Canceling the test mode
   Turn OFF the power switch.

3) Functions and key operations during the test mode

Note : For keys which are not on the player or on the remote controller, use the test mode remote controller (GGF1067).

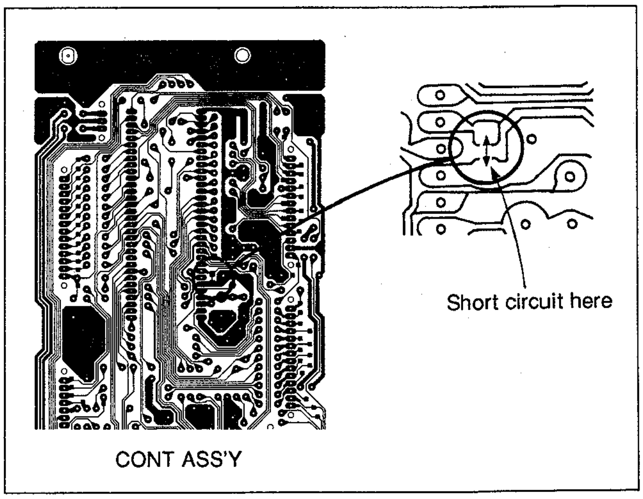


Fig. 1

- Key operation in the Test mode

Player Status	Key Operation	Function	Remarks
Tray Open	⏮ / ⏭ SKIP (Refer to Note 1)	⏮ : Shifts the tray in the closed direction and also raises the turn table while pressing the key. ⏭ : Shifts the tray in the open direction and also lowers the turn table while pressing the key.	
Tray Open	▶ PLAY	Clamps	
Clamp	▶ PLAY	Turns the disc through TRK Servo OFF	TRK– OFF
TRK Servo Open	▶ PLAY	TRK Servo ON	TRK– ON
TILT Neutral	+ MULTI-SPEED	TILT Servo ON	T–□ : ON
TILT ON	– MULTI-SPEED	TILT Neutral	T–□ : N
TILT Neutral or ON	⏮ / ⏭ SKIP	Setting TILT Servo to OFF, can force TILT to move.	T–1 to T–E
Clamp	⏪ / ⏩ SCAN	Can force the slider to move	S – LD S – CDV S – CD S – IN
Play	❚❚ PAUSE	Still	
Play	■ STOP	Stop	
Stop	▲ OPEN	Open	
Play	+10 ⇩ 0 to 9 ⇩ ▶ PLAY	Sets to SEARCH Lead Address Input mode. Designates the SEARCH lead address through keys 0 to 9. Press the CLEAR C key if the designated address is incorrect. Searches the designated address upon pressing the PLAY key.	

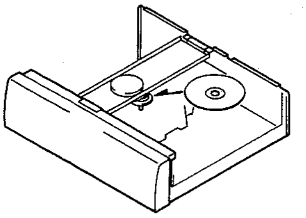
Note 1 : Press SKIP (⏮ / ⏭) Keys after the tray is set to open state by pressing Open (▲) key. Because, in tray open state, pressing PLAY (▶) key causes it to set to TILT control state and SKIP (⏮ / ⏭) keys can not function properly.

● PLAYER OPERATION IN THE TEST MODE

Operate the player by selecting a test mode function with the keys on the player or on the remote control unit.

- CD PLAYBACK

① Place the CD disc on the turn table.



② Press the PLAY (▶) key once. (Twin gear starts to move.)

③ Push the cam plate (Fig. 4) in the direction of the arrow and wait until the CD disc is clamped.

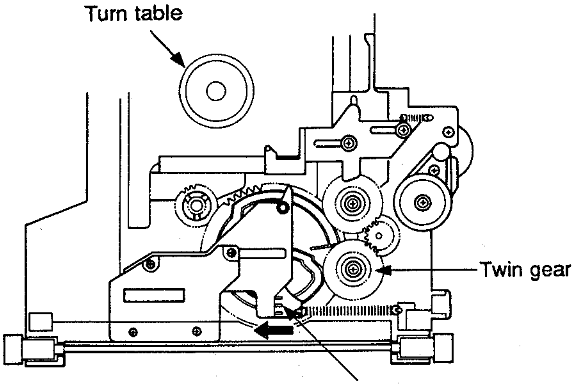


Fig. 4

④ Press the [◀◀] or [▶▶] keys to appear "S-CD" on the TV screen display.

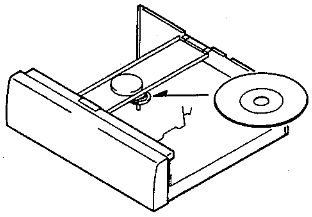
```
00000           K-FF
T-B:N           M-5
TRK-OFF         S-CD
                F-0



MODE00:00       00000
```

TV screen display

⑤ Press the PLAY (▶) key twice, disc will be normally playbacked.

- LD PLAYBACK

① Place the LD disc on the turn table.



② Press the PLAY (▶) key once. (Twin gear starts to move.)

③ Press the SKIP REV (⏮) key to raise the turn table (spindle motor section) while pressing the cam plate (Fig. 4) in the direction of the arrow. Raise it to the position where the LD disc can be easily placed on the turn table. If the turn table is raised too high, lower it with the SKIP FWD (⏭) key.

④ Place the LD disc on the turn table and press the PLAY (▶) key once to clamp the disc.

⑤ Press the [◀◀] or [▶▶] keys to appear "S-LD" on the TV screen display.

```
00000           K-FF
T-B:N           M-5
TRK-OFF         S-CD
                F-0



MODE00:00       00000
```

TV screen display

⑥ Press the PLAY (▶) key twice, disc will be normally playbacked.

7.2 TOOLS REQUIRED FOR ADJUSTMENTS

- Tools Required

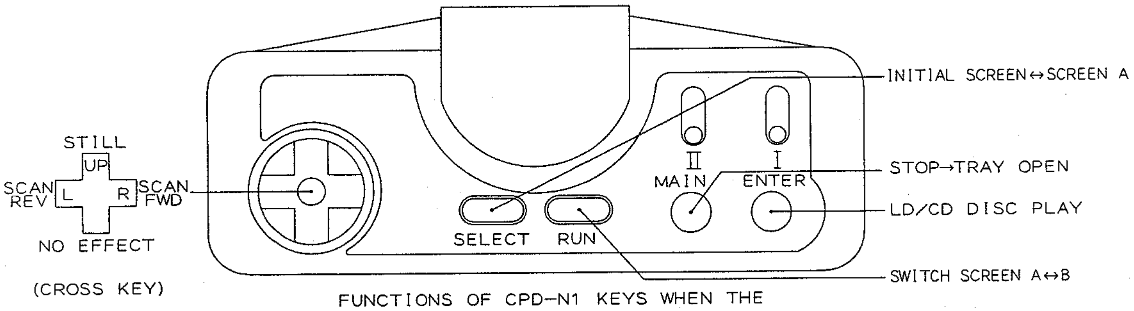
· CD test disc (STD−901 or STD−902)
· LD test disc (GGV1003)
· Medium-size blade screwdriver
· Small blade screwdriver
· Hexagonal wrench (with handle, 3mm sides)
· Resistors (10k ohm×2.47k ohm×1)
· Two-image oscilloscope (with delay)
· AF oscillator
· Frequency counter
· Digital voltmeter
· Monitor TV
· Low−pass filter
· Adjustment ROM cartridge (GGF1244)

7.3 ADJUSTMENT ROM CARTRIDGE (GGF1244)

- Adjustment ROM cartridge operation

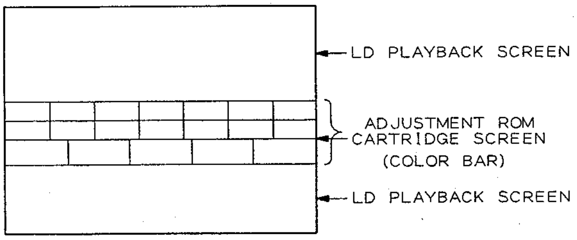
Use the adjustment ROM cartridge as follows :

1. Turn OFF the CLD−A100 power switch.
2. Attach the PAC−N10, ROM cartridge, and CPD−N1 to the CLD−A100. Turn ON the power switch. The initial display will appear. The keys of the CPD−N1 will also have the following functions :



STILL
UP
SCAN REV
L
R
SCAN FWD
NO EFFECT
(CROSS KEY)
SELECT
RUN
II
I
MAIN
ENTER
INITIAL SCREEN↔SCREEN A
STOP→TRAY OPEN
LD/CD DISC PLAY
SWITCH SCREEN A↔B

FUNCTIONS OF CPD−N1 KEYS WHEN THE ADJUSTMENT ROM CARTRIDGE IS USED.



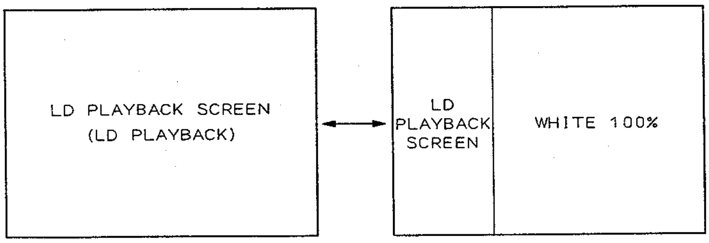
LD PLAYBACK SCREEN
ADJUSTMENT ROM CARTRIDGE SCREEN (COLOR BAR)
LD PLAYBACK SCREEN

INITIAL SCREEN

Note : This is used in "7.6 RGBB ASSEMBLY ADJUSTMENT" :

1. RGB encoder output level adjustment
3. APC adjustment

3. With the initial display on, press the CPD−N1's SELECT key. Display A will appear. Press the RUN key to switch between display B.



LD PLAYBACK SCREEN
(LD PLAYBACK)
LD PLAYBACK SCREEN
WHITE 100%

SCREEN A

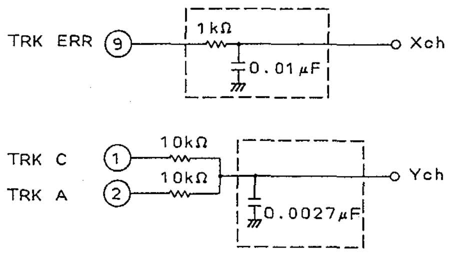
SCREEN B
(WITHOUT LUMINANCE MODE)

Note : This is used in "7.5 VIDEO ASSEMBLY ADJUSTMENT, 7. BRIGHTNESS KEY ADJUSTMENT."

7.4 ADJUSTMENTS OF PICKUP ASSY AND FTSB ASSY

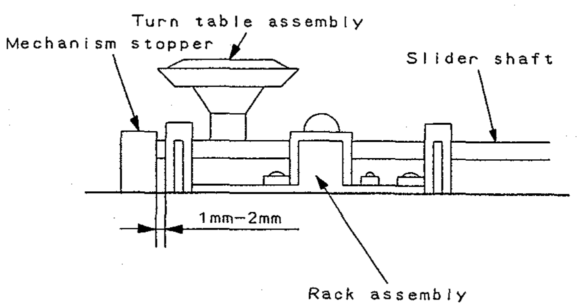
- NOTES FOR CENTERING ADJUSTMENT

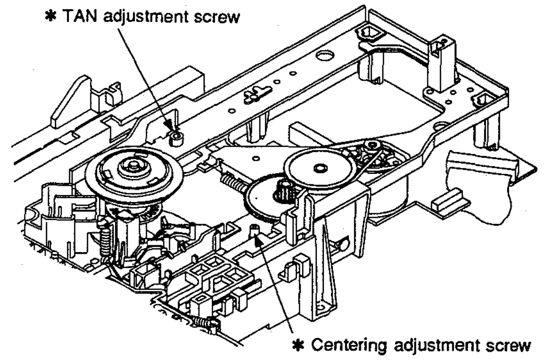
Use the low-pass filters below in the coarse centering adjustment 3. and fine centering adjustment 7. when the S/N of the waveform is heard to observe.


TRK ERR ⑨
1kΩ
0.01μF
Xch
TRK C ①
TRK A ②
10kΩ
10kΩ
0.0027μF
Ych

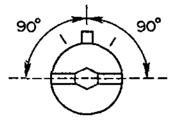
- RACK ASSEMBLY DURING CENTERING ADJUSTMENT

The S-IN position (without hitting the mechanism stopper) of the rack assembly during centering adjustment is indicated below.

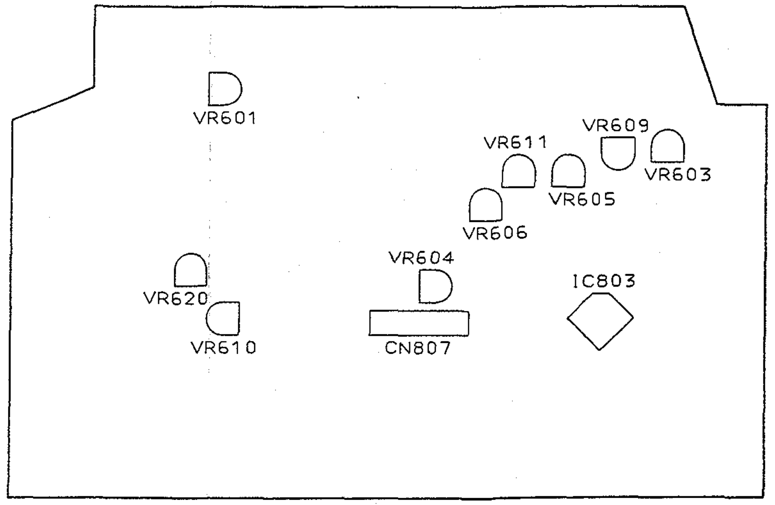

Turn table assembly
Mechanism stopper
Slider shaft
1mm–2mm
Rack assembly


✱ TAN adjustment screw
✱ Centering adjustment screw

✱ : As the adjustment range of both the TAN and centering adjustment screws is only ±90° from the center, do not turn the screws beyond this range.

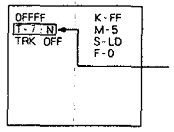
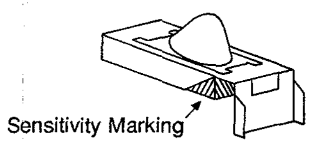
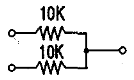
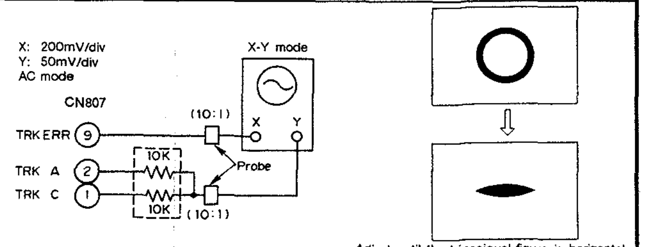
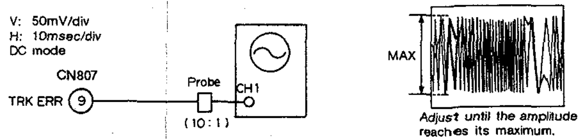
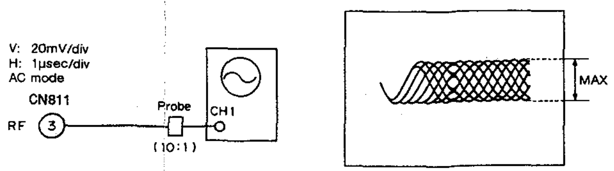


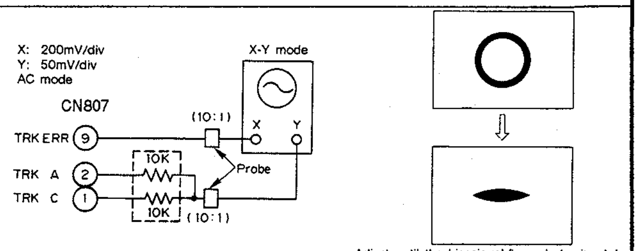
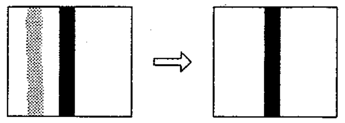
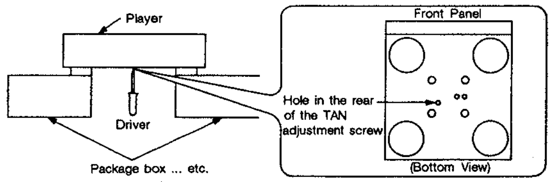
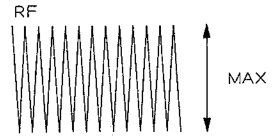
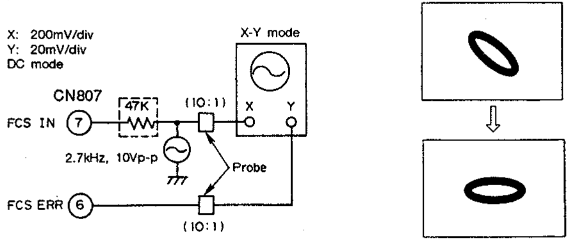
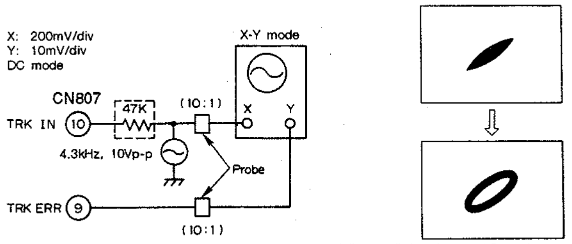
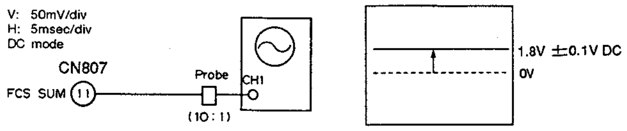
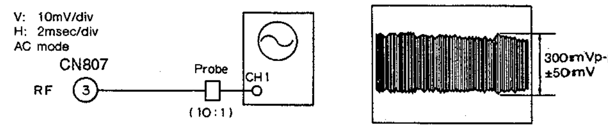
TILT base section


VR601
VR611
VR609
VR603
VR605
VR606
VR604
VR620
IC803
VR610
CN807

FTSB ASS'Y Adjustment diagram

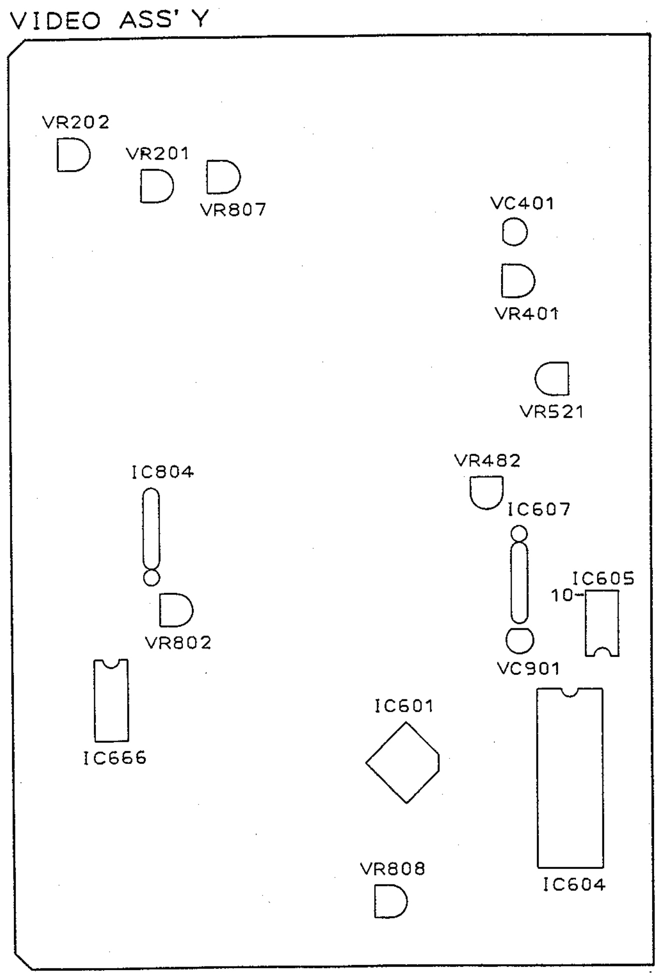
ADJUSTMENT TABLE

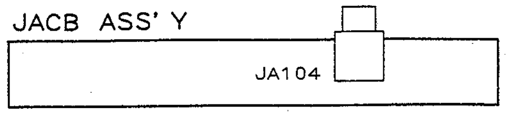
	Adjustment name	Adjustment point	Measuring equipment and jigs	Measurement point	Player condition	Adjustment procedure	Waveform and connection diagram
1	Tilt Offset Check and Adjustment	FTSB assembly VR610	TV monitor	Tilt indication on Test mode screen	· Power ON · Test mode · Disc not installed	1. Check if the tilt indication on the Test mode screen is at T-6 to T-8. 2. If the tilt indication is not at T-6 to T-8, adjust VR610 until the tilt indication reaches T-6 to T-8.	 OFFFF T-7:N TRK OFF K-FF M-5 S-LD F-0 Adjust VR610 while looking at the figure on the Test mode screen.
2	Tilt servo Gain adjustment	FTSB assembly VR620	—	—	· Power ON · Test mode · Disc not installed	Check the dot marking on the tilt sensor and turn VR620 below. Red···turn fully clock wise Non ···middle position Blue···turn fully counter clock wise	 Sensitivity Marking Sensor stay of tilt sensor
3	Coarse centering adjustment	Tilt base Centering adjustment screw	· Oscilloscope · STD-901 or STD-902 · MIX resistor 	CN807 X : ⑨Pin (TRK ERR) Y : ①+②Pin (TRK SUM)	· Test mode TRK servo OFF Tilt servo ON · Innermost track of STD-901 or STD-902 Which dose not come in contact with the mechanical stopper.	1. Move the slider until it does not come in contact with the mechanical stopper at the slider position indication S-IN. 2. Observe TRK ERR (Xch) and TRK SUM (Ych) at the X-Y mode during TRK Servo OFF. 3. Turn the centering adjustment screw until the Lissajous' figure is horizontal.	 X: 200mV/div Y: 50mV/div AC mode X-Y mode CN807 (10:1) X Y TRK ERR ⑨ 10K Probe TRK A ② TRK C ① 10K (10:1) Adjust until the Lissajous' figure is horizontal.
4	FCS balance adjustment (1) TRK ERR MAX	FTSB assembly VR605	· Oscilloscope · STD-901 or STD-902	CN807 ⑨Pin (TRK ERR)	· Test mode TRK servo OFF Tilt servo ON · Inner track of STD-901 or STD-902	1. Observe TRK ERR at CH1 of the oscilloscope during TRK Servo OFF. 2. Adjust VR605 until the amplitude of the waveform reaches its maximum.	 V: 50mV/div H: 10msec/div DC mode CN807 Probe CH1 TRK ERR ⑨ (10:1) MAX Adjust until the amplitude reaches its maximum.
5	FCS balance adjustment (2) RF MAX	FTSB assembly VR611	· Oscilloscope · STD-901 or STD-902	CN811 ③Pin (RF)	· Test mode TRK Servo ON Tilt servo ON · Inner track of STD-901 or STD-902	1. TRK servo is ON and observe RF at CH1 of the oscilloscope. 2. Adjust VR611 until the amplitude of the waveform reaches its maximum and the envelope is very clear.	 V: 20mV/div H: 1μsec/div AC mode CN811 Probe CH1 RF ③ (10:1) MAX Adjust until the amplitude reaches its maximum and the envelope is very clear.
6	Tangential direction angle adjustment	Tilt base TAN adjustment screw	· Oscilloscope · STD-901 or STD-902	CN811 ③Pin (RF)	· Test mode TRK Servo ON Tilt servo ON · Inner track of STD-901 or STD-902	1. Observe RF at CH1 of the oscilloscope during TRK Servo ON. 2. Adjust the TAN adjustment screw until the amplitude of the waveform reaches its maximum and the envelope is very clear.	

	Adjustment name	Adjustment point	Measuring equipment and jigs	Measurement point	Player condition	Adjustment procedure	Waveform and connection diagram
7	Fine centering adjustment	Tilt base Centering adjustment screw	· Oscilloscope · STD－901 or STD－902	CN807 X : ⑨Pin (TRK ERR) Y : ①+②Pin (TRK SUM)	· Test mode TRK servo OFF Tilt servo ON · Innermost track of STD－901 or STD－902 which does not come in contact with the mechanical stopper.	Perform fine centering adjustment by following the same procedure as in "Coarse centering adjustment" (2).	 X: 200mV/div Y: 50mV/div AC mode X-Y mode CN807 (10:1) X Y TRK ERR ⑨ 10K Probe TRK A ② TRK C ① 10K (10:1) Adjust until the Lissajous' figure is horizontal.
8	Crosstalk check and Tilt offset adjustment	FTSB assembly VR610	· TV monitor · GGV1003	Crosstalk check screen	· Test mode TRK servo ON Tilt servo ON · GGV1003 #115 STILL	1. Search for address 115 of GGV1003 and still the address. 2. Check the crosstalk. If the crosstalk is pronounced, adjust VR610 until the crosstalk is not noticeable.	 If the crosstalk is pronounced, adjust until the crosstalk is not noticeable.
	When the crosstalk is still noticeable in spite of the adjustment in (8), use a hexagonal wrench driver (straight type, size : 3 mm) to adjust the TAN adjustment screw on the bottom side of the player through the GGV1003 #115 STILL screen. Afterwards, perform the adjustment procedures from (7).						 Player Front Panel Hole in the rear of the TAN adjustment screw Driver Package box ... etc. (Bottom View)
9	FCS Balance adjustment (3) RF level MAX.	FTSB assembly VR606	· Oscilloscope · GGV1003	CN807 ③Pin (RF)	· Test mode TRK servo ON Tilt servo ON	1. Connect the CH1 of oscilloscope to CN807－3Pin and check the RF waveform during TRKG servo is ON. 2. Adjust VR606 so that the RF waveform become MAX.	
10	FCS servo loop gain adjustment	FTSB assembly VR604	· Oscilloscope · GGV1003 · AF Oscillator · Resistor (47kΩ)	CN807 X : ⑦Pin (FCS IN) Y : ⑥Pin (FCS ERR)	· Test mode TRK servo ON Tilt servo ON · GGV1003 #15,000STILL	1. Search for address 15,000 of GGV1003 and still the address. 2. Xch : Connect the resistor (47 kΩ) to the channel and connect to FCS IN. Ych : Connect to FCS ERR. 3. Connect the AF oscillator between Xch and the 47 kΩ resistor, and adjust VR604 until the Lissajous' figure is symmetrical.	 X: 200mV/div Y: 20mV/div DC mode X-Y mode CN807 47K (10:1) X Y FCS IN ⑦ 2.7kHz, 10Vp-p Probe FCS ERR ⑥ (10:1) Adjust until the Lissajous' figure is symmetrical.
11	TRK servo loop gain adjustment	FTSB assembly VR603	· Oscilloscope · GGV1003 · AF Oscillator · Resistor (47kΩ)	CN807 X : ⑩Pin (TRK IN) Y : ⑨Pin (TRK ERR)	· Test mode Stop mode or TRK servo ON Tilt servo ON · GGV1003 #15,000STILL	1. Xch : Connect the 47 kΩ resistor to channel and connect to TRK IN. Ych : Connect to TRK ERR. 2. Connect the AF oscillator between Xch and the 47 kΩ resistor and note the tilt angle against the horizon with the disc in the stopped state. 3. Search for address 15,000 of GGV1003 and still the address. 4. Set the disc in PLAY mode (TRK servo closed, TILT on). Adjust VR603 so that the tilt angle of the waveform will be the same as the tilt angle noted in step 3.	 X: 200mV/div Y: 10mV/div DC mode X-Y mode CN807 47K (10:1) X Y TRK IN ⑩ 4.3kHz, 10Vp-p Probe TRK ERR ⑨ (10:1) Adjust until the Lissajous' figure is symmetrical.
12	FCS SUM level check	FTSB assembly VR609	· Oscilloscope · GGV1003	CN807 ⑪Pin (FCS SUM)	· Test mode TRKGservo ON Tilt servo ON · GGV1003 #15,000STILL	Adjust VR609 so that the voltage of CN807－⑪Pin become 1.8 V ±0.1 V DC.	 V: 50mV/div H: 5msec/div DC mode CN807 Probe CH1 FCS SUM ⑪ (10:1) 1.8V ±0.1V DC 0V
13	RF level adjustment	FTSB assembly VR601	· Oscilloscope · GGV1003	CN807 ③Pin (RF)	· Test mode TRK servo ON Tilt servo ON · GGV1003 #15,000 STILL	1. Search for address 15,000 of GGV1003 and still the address. Observe RF at CH1 of the oscilloscope. 2. Adjust VR601 until the RF amplitude is 300 mV ±50 mV p－p.	 V: 10mV/div H: 2msec/div AC mode CN807 Probe CH1 RF ③ (10:1) 300mVp-p ±50mV

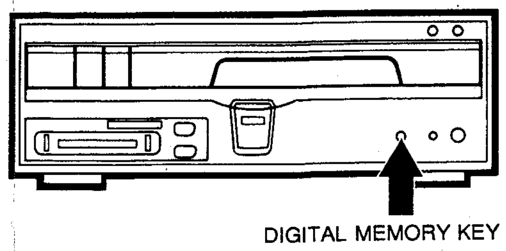
7.5 ADJUSTMENTS OF VIDEO ASSY

- VIDEO ASSEMBLY ADJUSTMENT DIAGRAM



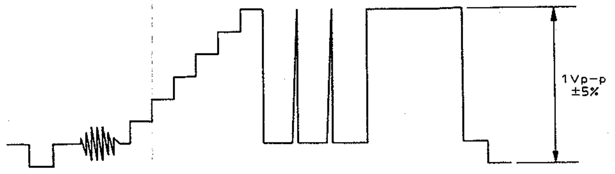


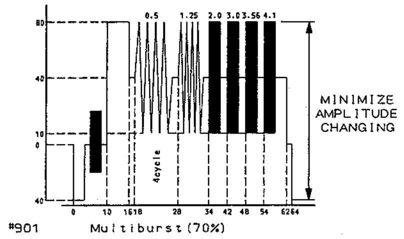
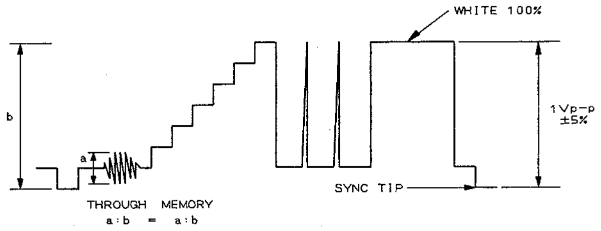
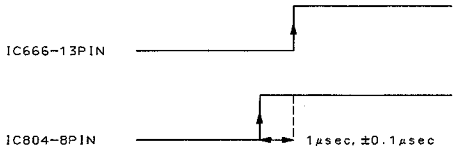
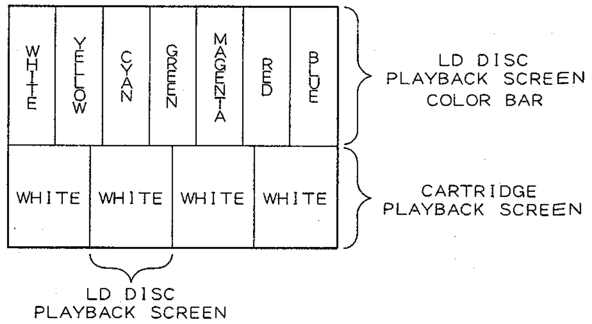
- VIDEO ASSEMBLY ADJUSTMENT NOTES



- To switch between the through mode and memory mode, press the DIGITAL MEMORY key on the CLD-A100.
- Before removing or installing the pack, be sure to turn OFF the power switch.
- Using the LD video and game video together
  When the LD video and game video are used together, the LD video will have field playback, with non-interlace. As a result, the vertical resolution will be half of the usual resolution. However, picture flicker will be eliminated. Even when a V shell display is executed while a normal disc (other than LD-ROM games) is played, only one field will playback due to non-interlacing.
  For memory through, turning the V shell ON/OFF might result in irregular tints even if the adjustment is correct. During an LD-ROM game, playback can be switched between field 1 and 2 by game software.
- Key and remote control operations during a game
  During a ROM-card based game, only the main unit's OPEN/CLOSE key will be operational. A disc can thereby be removed or loaded.
- Remote controller power ON/OFF
  The power can be turned ON/OFF with the remote controller only when a pack has not been installed.
  If a pack has been installed, the remote controller cannot be used to turn OFF/ON the power. This is to protect the pack. Since the remote controller cannot be used for power ON/OFF during V shell operation, the last memory function will also be cleared.
- Power OFF with the main unit's POWER key
  When the power is turned OFF with the POWER key on the main unit, the power will turn OFF immediately. IN concert with the POWER key, the pack's release mechanism will be canceled. The pack can thereby be installed or removed immediately. If, for example, the power is turned OFF while the tray is open, the power will turn OFF with the tray still open.

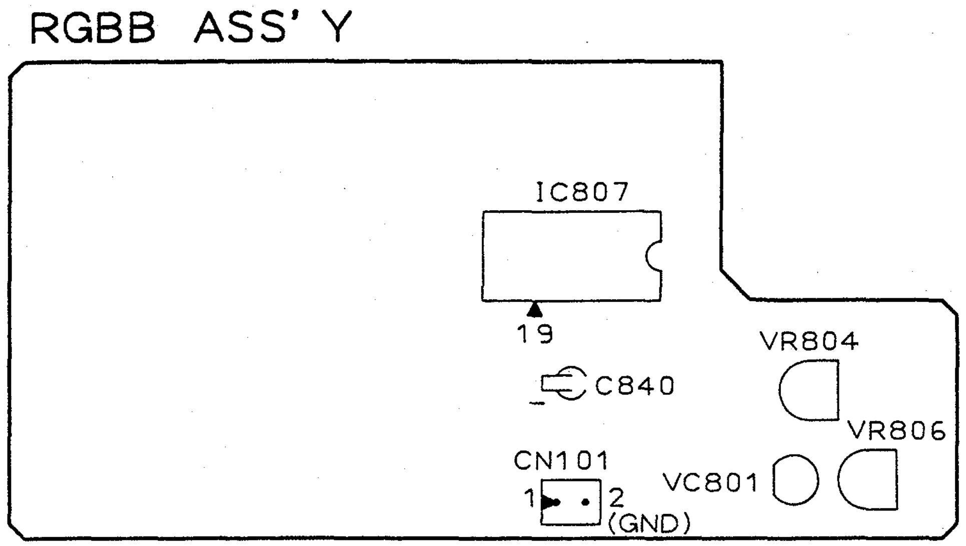
ADJUSTMENT TABLE OF VIDEO ASSY

	Adjustment name	Adjustment point	Measuring equipment and jigs	Measurement point	Player condition	Adjustment procedure	Waveform and connection diagram
1	Master clock adjustment	VR808 VC901	· Frequency counter · Oscilloscope	IC605—10P IC607—8p	· STOP (POWER ON)	Connect a frequency counter to IC605—10P, with the player's power ON (STOP), adjust VR808 so that the frequency becomes 18.12587 MHz. Connect an oscilloscope to IC607—8P, adjust VC901 so that the DC voltage becomes 0.2±0.3V.	
2	Output video level adjustment (1)	VR482	· Oscilloscope · TV monitor	VIDEO output terminal (75Ω terminated)	· Through mode · #19,900Still	Connect an oscilloscope to the video output, during still playback of #19,900 of GGV1003 observe the VIDEO signal waveform in the through mode. Adjust VR482 so that the white 100% level from the sync tip becomes 1Vp-p ± 5%.	

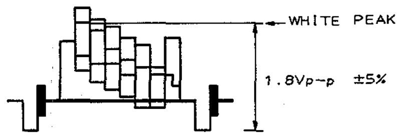
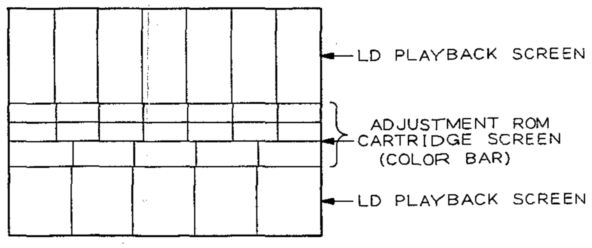
	Adjustment name	Adjustment point	Measuring equipment and jigs	Measurement point	Player condition	Adjustment procedure	Waveform and connection diagram
3	VPS error adjustment	VR521	· TV monitor	Video output terminal (75Ω terminated)	· Through mode · #8,000Still	During still playback (magenta screen) of GGV1003 #8,000 in through mode, adjust VR521 to minimize the color irregularity on the screen.	
4	140nSEC, shift adjustment	VR401 VC401	· Oscilloscope · TV monitor	Video output terminal (75Ω terminated)	· Memory mode · #901 Still · #8,000Still	1. Connect an oscilloscope to the video output terminal, during still playback of GGV1003 #19,900 in memory mode, adjust VR401 to minimize the amplitude changing. 2. Connect a TV monitor to the video output terminal, during still playback of GGV1003 #8,000, adjust VC401 to minimize the flicker (especially on the top of display).	
5	Output video level adjustment (2)	VR201 VR202	· Oscilloscope · Test disc (GGV1003)	Video output terminal (75Ω terminated)	· #19,900Still · Memory mode	1. Connect an oscilloscope to the video output terminal, during still playback of GGV1003 #19,900 in the memory mode, adjust VR202 so that the white 100% level from the sync tip becomes 1Vp-p ± 5% 2. During playback, alternately switching memory/through modes, adjust VR 201 so that the ratio of chroma signal level with the white 100% level from the sync tip of the memory mode and of the through mode are the same.	 WHITE 100% b a 1Vp-p ±5% SYNC TIP THROUGH MEMORY a:b = a:b
6	VCXO error adjustment	VR802	· Oscilloscope · PAC−N10	IC666-13 IC804-8	· Power swtch ON · STOP	1. Turn the power switch OFF. 2. Connect IC666-13P to the oscilloscope's CH-1 and IC804-8P to CH-2, then install PAC-N10 to the main unit. 3. Turn the power switch ON, observe waveforms of CH-1 and CH-2, adjust VR802 so that each waveform's time lag becomes 1.0±0.1μsec.	
7	Luminance key adjustment (Y-COMP)	VR807	· TV monitor · PAC−N10 · CPD−N1 · Adjustment ROM cartridge (GGF1244) · LD Test disc (GGV1003)		· Power swtch ON · Without luminance mode · Color bar (#5401) Still	1. Turn the power switch OFF. 2. Set PAC−N10, the adjustment ROM cartridge and CPD-N1 to the main unit,, then turn the power ON. 3. Press Ⅱ key of the CPD−N1, open the disc tray. 4. Set the GGV1003 to the tray, then press the Ⅰ key of CPD-N1, starts playback. 5. Press the cross key (right) of CPD−N1 to scanning disc, then press the cross key (up) to still playback at the color bar (#5401). 6. Press SELECT key of CPD−N1 once, then press RUN key(without luminance mode). Adjust VR807 so that the playback screen's bottom side is white like the figure. Note : Frame No. does not appear on the display when the adjustment ROM cartridge is installed.	 WHITE YELLOW CYAN GREEN MAGENTA RED BLUE LD DISC PLAYBACK SCREEN COLOR BAR WHITE WHITE WHITE WHITE CARTRIDGE PLAYBACK SCREEN LD DISC PLAYBACK SCREEN

7.6 ADJUSTMENTS OF RGBB ASSY

- RGBB ASSEMBLY ADJUSTMENT DIAGRAM



ADJUSTMENT TABLE OF RGBB ASSY

	Adjustment name	Adjustment point	Measuring equipment and jigs	Measurement point	Player condition	Adjustment procedure	Waveform and connection diagram
1	RGBencoder output level adjustment	VR806	· Oscilloscope · PAC−N10 · Adjustment ROM cartridge (GGF1244)	IC807-19		1. Turn the power switch OFF. 2. Connect an oscilloscope to IC807−19 pin. 3. Set PAC−N10 and the adjustment ROM cartridge, turn the power switch ON. 4. Observe the initial screen of the adjustment ROM cartridge by the oscilloscope, adjust VR806 so that the level between the sync tip and the white peak becomes 1.8Vp-p ±5%	 Waveform of the adjustment ROM cartridge initial screen
2	3.58MHz free run frequency adjustment	VC801	· Frequency counter	CN101-1	· Power swtch ON · Connect − side of CN840 to GND.	Note) Remove PAC-N10 before adjustment. Connect a frequency counter to CN101-1 pin, adjust VC801 so that the frequency becomes 3.579545MHz ± 10Hz. (Connect the probe's GND of the frequency counter to CN101-2 pin)	
3	APC adjustment	VR804	· TV monitor · GGV1003 · PAC−N10 · CPD−N1 · Adjustment ROM cartridge (GGF1244)	TV monitor screen	· LD screen and background overlay mode · GGV1003 Color bar(#5,401) still	1. Turn the power switch OFF. 2. Set PAC−N10, the adjustment ROM cartridge and CPD−N1 to the main unit, turn the power switch ON. 3. Press Ⅱ key of the CPD−N1, open the disc tray. 4. Set the GGV1003 to the tray, then press the Ⅰ key of CPD-N1, starts playback. 5. Press the cross key (right) of CPD−N1 to scanning disc, then press the cross key (up) to still playback at the color bar (#5,401). 6. Adjust VR804 so that color phases of each color bar of LD disc and of cartridge are the same. Note: Frame No. does not appear on the display when the adjustment ROM cartridge is installed.	 LD PLAYBACK SCREEN ADJUSTMENT ROM CARTRIDGE SCREEN (COLOR BAR) LD PLAYBACK SCREEN

8. SYSTEM CONTROL DESCRIPTION

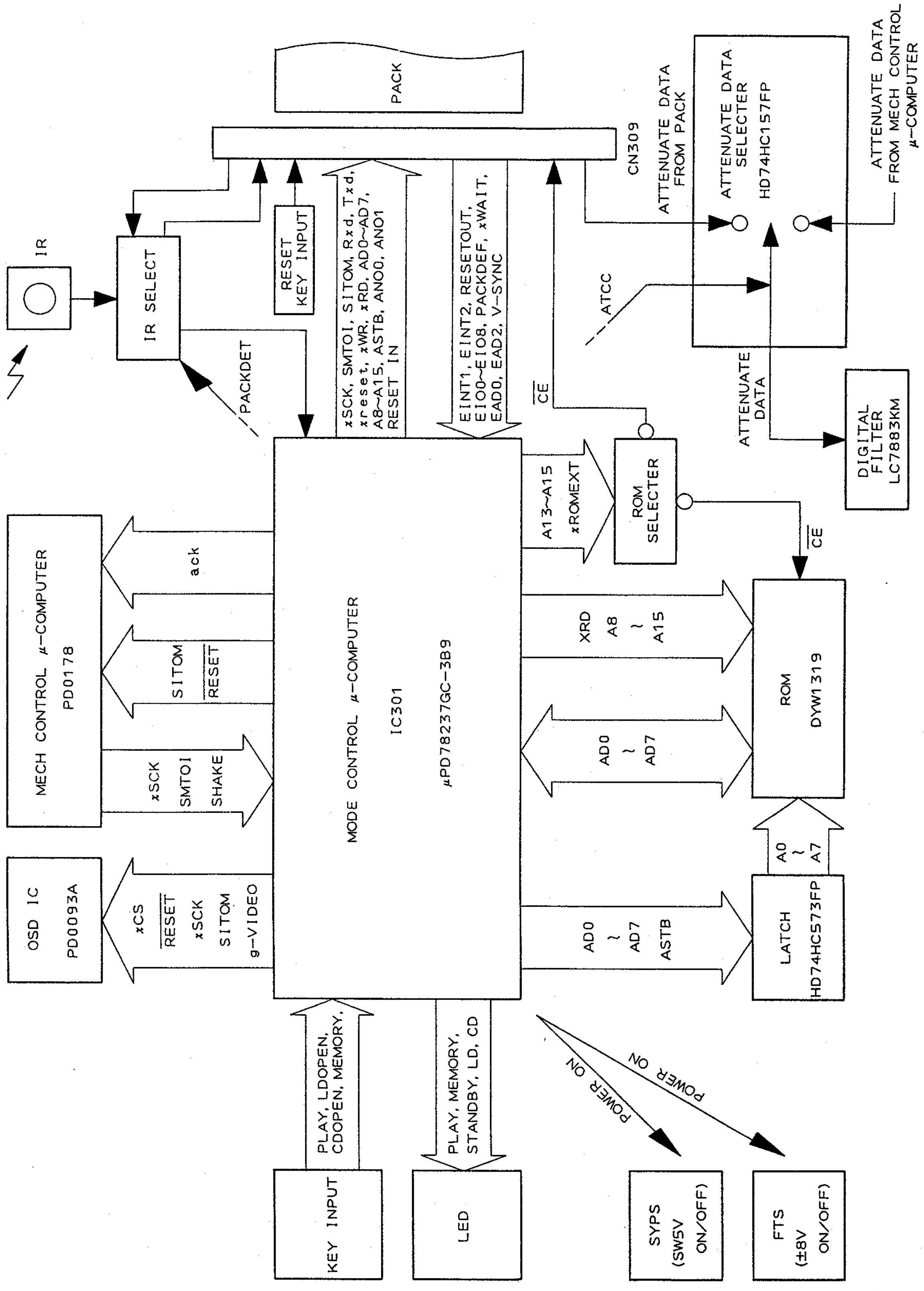

PACK
CN309
ATTENUATE DATA FROM PACK
ATTENUATE DATA SELECTER HD74HC157FP
ATTENUATE DATA FROM MECH CONTROL µ-COMPUTER
IR
IR SELECT
RESET KEY INPUT
xSCK, SMTOI, SITOM, Rxd, Txd, xreset, xWR, xRD, AD0~AD7, A8~A15, ASTB, ANO0, ANO1 RESET IN
EINT1, EINT2, RESETOUT, EIO0~EIO8, PACKDEF, xWAIT, EAD0, EAD2, V-SYNC
CE
ATCC
PACKDET
ATTENUATE DATA
DIGITAL FILTER LC7883KM
MECH CONTROL µ-COMPUTER PD0178
ack
SITOM
RESET
xSCK
SMTOI
SHAKE
MODE CONTROL µ-COMPUTER IC301 µPD78237GC-3B9
A13~A15
xROMEXT
ROM SELECTER
CE
XRD
A8 ~ A15
ROM DYW1319
AD0 ~ AD7
A0 ~ A7
OSD IC PD0093A
xCS
RESET
xSCK
SITOM
g-VIDEO
AD0 ~ AD7
ASTB
LATCH HD74HC573FP
PLAY, LDOPEN, CDOPEN, MEMORY,
PLAY, MEMORY, STANDBY, LD, CD
POWER ON
POWER ON
KEY INPUT
LED
SYPS (SW5V ON/OFF)
FTS (±8V ON/OFF)

Fig. 8—1 Brock diagram of control section

8.1 MICROCOMPUTER INTERFACE

The microcomputer system of this model consists of two chips, an 8 - bit microcomputer (IC201 : PD0178) which controls the mechanism and a 4 - bit microcomputer (IC301 : µPD78237GC - 3B9) which controls the operations and displays.
These two microcomputers are connected via a serial interface. The communication lines are also used for controlling the character generator IC (IC807 : PD0093A).

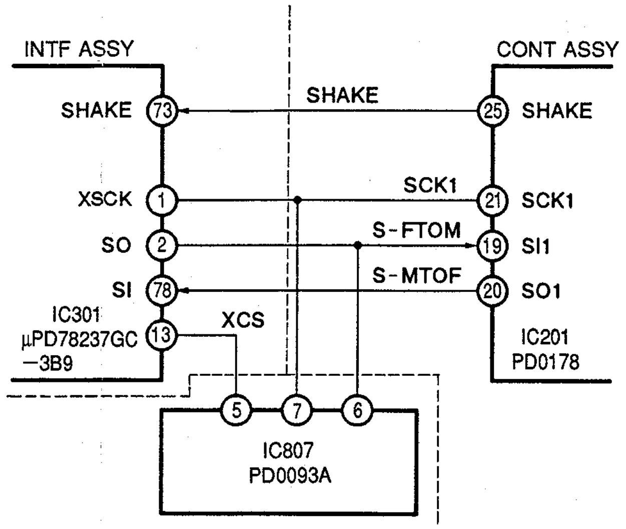

INTF ASSY
CONT ASSY
SHAKE 73
SHAKE
25 SHAKE
XSCK 1
SCK1
21 SCK1
SO 2
S-FTOM
19 SI1
SI 78
S-MTOF
20 SO1
IC301 µPD78237GC -3B9 13
XCS
IC201 PD0178
5 7 6
IC807 PD0093A

Fig. 8—2 Serial interface connection

8.2 MICROCOMPUTER COMMUNICATION SEQUENCE

1. The PD0178 sets the SHAKE terminal (pin25) to "L" for several microseconds as a request to the µPD78237GC - 3B9 for the start of a communication.
2. When the µPD78237GC - 3B9 receives the communication start request, it sets the SHAKE terminal (pin73) to "L" and informs the PD0178 that it is ready for communication.
3. The PD0178 then sets SCK1 (pin21), which has been used as an input port, to output mode, The µPD78237GC - 3B9 sets XSCK (pin1) to the input mode, connecting the communication lines between the microcomputers.
4. The PD0178 sends the transfer clock (500KHz) in 8bits. The data are then sent and received in synchronization with this clock.
5. When µPD78237GC - 3B9 receives data of 8 bits, it sets the SHAKE terminal (pin73) to "H" and reports that a single communication is completed.
6. The PD0178 sets SCK1 (pin21) to input mode, and the µPD 78237GC - 3B9 sets XSCK (pin1) to output mode. The communication line is thereby disconnected and a single communication is completed.

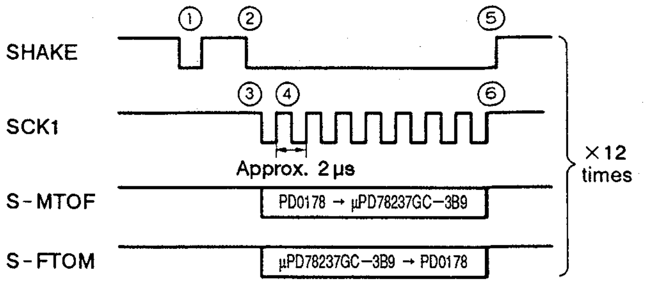

SHAKE
①
②
⑤
SCK1
③
④
⑥
Approx. 2µs
S-MTOF
PD0178 → µPD78237GC-3B9
S-FTOM
µPD78237GC-3B9 → PD0178
×12 times

Fig. 8—3 Timing chart of the microcomputer interface

- The communication takes place within a cycle between 10 and 30ms. Twelve bytes of data are transmitted at one time.
- The handshake is done on a single line. Both the PD0178 and the µPD78237GC - 3B9 use a single port for both input and output. The port is set to output mode when the output is "L". In other conditions, it will be set to input mode (high impedance). Before "L" is output, both ports mutually confirm that the SHAKE terminal is "H". This is to prevent signal interference between tray output signals.
- The communication data is appended with a check code to prevent transfer errors. If sixteen consecutive transfer errors are detected, the µPD78237GC - 3B9 will send the reset signal to the PD0178 to reset it to its initial state. This will also happen when the communication is not executed for 300ms or longer.

8.3 OUTLINE OF THE MECHANISM CONTROL SYSTEM

1) Processing immediately after power ON

When power is applied, the mechanism – control microcomputer (IC201 : PD0178) will execute initialization in the following sequence upon reset cancellation (pin28 : L to H).

1. The internal RAM and ports are initialized.
2. The CXD2500BQ is initialized.
3. The tray position is detected.
4. The FTS – IC PM3003 is initialized.
5. The TBC – IC PDB011 is initialized.
6. Communication with the µPD78237GC – 3B9 is confirmed. (If any trouble is found, the subsequent initialization procedures will not be performed.)
7. The pickup position is initialized.
8. Disc rotation stops.
9. Loading mode is initialized.

After all the initialization procedures are completed, normal operations can begin.

2) Control of the loading motor

Driving of the loading motor is controlled by a PWM signal supplied from pin18 of the mechanism – control CPU (IC201) in the CONT Assembly. The voltage applied to the loading motor is switched according to the duty of the PWM signal as follows. The PWM cycle is approximately 910µsec.

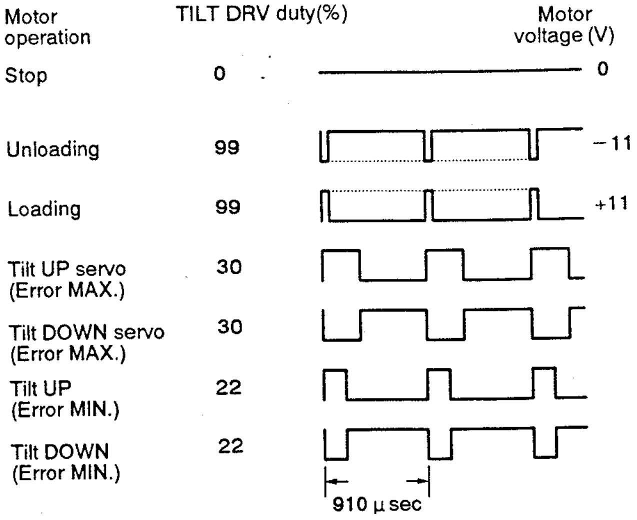


Fig. 8—4

● Loading/clamp operation

For the disc tray open/close and disc clamp and stop operations, the motor is operated while the position of the cam gear is detected by the loading/tilt – position detection switch connected to pins33 through 35 of the PD0178.

● Tilt servo operation

When an LD disc or a CDV disc (video portion) is played back and when a CDV disc is started up, the loading motor is used for the tilt servo. The loading motor is driven by a PWM drive in this mode as well.

The tilt servo operates the loading motor so that the input voltage at pin9 (TILT ERR) of the PD0178 becomes 2.5 V.
The tilt servo operates in the following ranges during normal playback.

CAV disc	(12-inch)	: Frames 0 – 40999
	(8-inch)	: Frames 0 – 16999
CLV disc	(12-inch)	: 0 min. – 44 min. 59 sec.
	(8-inch)	: 0 min. – 13 min. 59 sec.
CDV disc	(video portion)	: 0 min. 0 sec. – (Recording time – 1 min. 23 sec.)
CD disc	: The tilt servo is ON only at start-up.	

If some trouble occurs with the disc or tilt sensor circuit which prevents the input voltage at the TILT terminal from being within the specified range even if the pickup inclines to more than ±2° (degrees), the loading motor will be stopped upon detection of the state of the mechanism switch.

The tilt servo switchs the duty of the PWM signal in 2 levels according to the error value. When the error value is small (1.25V – 3.75V), a PWM signal for small duty 22% is output, and when the error value is large (0V – 1.25V, 3.75 – 5V), a PWM signal for large duty 30% is output. (See Fig. 8 – 4)

● Auto Tracking Balance Operation

AUTO TRKG BAL Control (ATB)

ATB can start only after the disc makes one rotation. Sampling is done for 300msec (150 rotations) and the corresponding PWM is set. The PWM set in the end is calculated from the total of 8 rotations from 142nd to 149th rotation. In the test mode during tracking open, the count starts (from 140) after the tracking closes when the current rotation is deemed to be the 140th. The PWM is calculated from the total of 8 rotations from the 142nd to the 149th one. During TRK open, the tracking error signal which is output from CXA1081S (IC801, pin 20) is detected respectively by the upper and lower sides and added. The tracking balance error signal is thereby obtained. After undergoing equalizing and level conversion, the error signal is input to IC101 pin8 as TBAL ERR. Based on this error, the duty pulse is output form IC101 pin12 and smoothed. Then it is supplied to IC801 pin11 input TRK C so that the tracking balance becomes 0V center. Each time a disc starts up, the tracking balance is obtained during the tracking open period.
The corresponding voltage is held thereafter. The auto tracking balance is set to operate constantly during the test mode tracking open.

3) Slider motor control

The mechanism control IC controls the drive signal output from pin20 of the FTS servo IC by the serial command.
The voltage applied to the slider motor is switched according to the duty of the PWM signal as follows. The PWM cycle is 36mS.

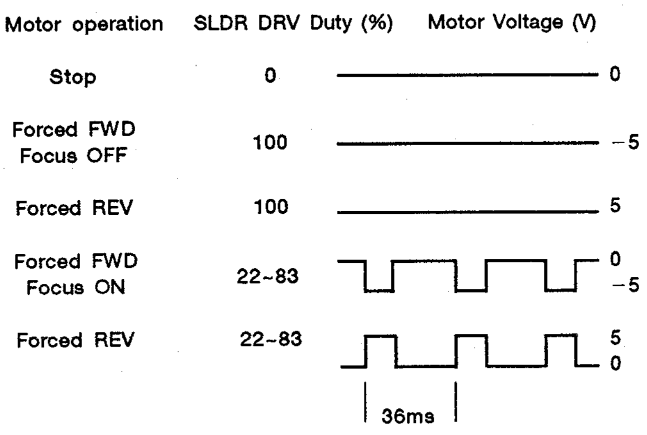

Motor operation
SLDR DRV Duty (%)
Motor Voltage (V)
Stop
0
0
Forced FWD Focus OFF
100
−5
Forced REV
100
5
Forced FWD Focus ON
22~83
0
−5
Forced REV
22~83
5
0
36ms

Fig. 8—5

4) Audio control

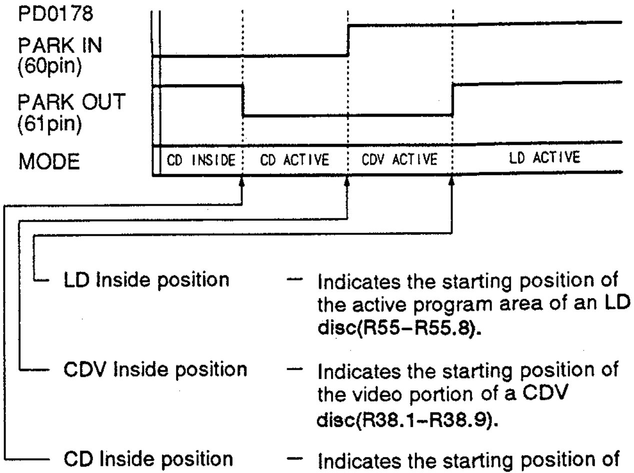
Digital audio channel switching is performed by the CXD2500BQ by using a command from the microcomputer.

DIGITAL 45	SQ1 14	SQ2 13	L-ch Line Out	R-ch Line Out
L	L H L H	L L H H	Analog L ch Analog L ch Analog R ch Mute	Analog R ch Analog L ch Analog R ch Mute
H	L	L	Digital L ch Digital L ch Digital R ch Digital − 12dB-L	Digital R ch Digital L ch Digital R ch Digital − 12dB-L

Table. 8—1

- SLDR POSITION

* The following positions can be detected by using two switches in combination.


PD0178
PARK IN (60pin)
PARK OUT (61pin)
MODE
CD INSIDE
CD ACTIVE
CDV ACTIVE
LD ACTIVE

LD Inside position — Indicates the starting position of the active program area of an LD disc(R55−R55.8).

CDV Inside position — Indicates the starting position of the video portion of a CDV disc(R38.1−R38.9).

CD Inside position — Indicates the starting position of the active program area of a CD disc(R26−R27.1).

R:The distance from the center of the spindle motor.

Fig. 8—6

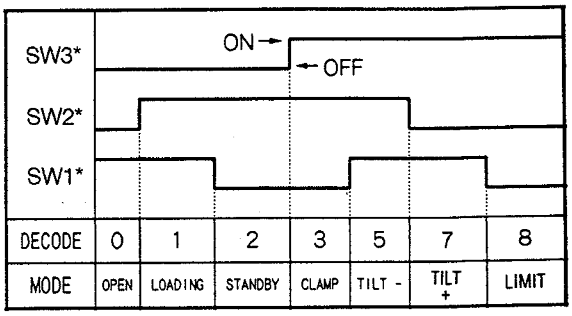

SW3*
ON
OFF
SW2*
SW1*
DECODE
0
1
2
3
5
7
8
MODE
OPEN
LOADING
STANDBY
CLAMP
TILT -
TILT +
LIMIT

Fig. 8—7 LOADING/TILT POSITION

5) CLV Clear Scan

Clear scan without picture distortion is possible also for CLV discs by using the shuttle ring (either on the player or the remote control unit).

The conventional color-lock scan and the clear scan can be switched depending on the angle of the shuttle ring rotation. In a clear-scan operation, scanning is performed while outputting digital audio at -12 dB (the same as scanning on CD). (No audio is output when analog audio is selected.)

The principle of the operation is as follows.

1. When clear scan mode is activated, the specified number of tracks is skipped in a multi-track jump operation.
2. Measures the time lag (phase difference) between PB – V and REF – V and when the measured value is within a certain range, decreases REF – H by 7 H until the phase difference between PB – V and REF – V is lost (VLOCK), then cancels squelch, displaying the video portion of the disc for a certain period. Returns to step 1 and repeats steps 1 and 2.

When the time lag between PB – V and REF – V exceeds a certain range, performs a 1-track jump (2-track jump in the REV direction) and measures the lag again. When the measured value is within a certain range, decreases REF – H by 7 H waiting for VLOCK between PB – V and REF – V. Otherwise, repeats a 1-track jump and time-lag measurement.

If the time lag does not enter a certain range even after repeating the 1-track jump and time-lag measurement operation three times, a multi-track jump is performed for a larger skip and is repeated step 2 from the beginning.

If the lag persists in not entering a certain range, VLOCK wait state is activated.

- * Gray-background video is output when no disc video is supplied.
- * Digital audio to be played during clear scan is output while the disc video is being supplied and in VLOCK wait state.
- * For CAV discs, nearly the same operation is performed.
- * PB – V (playback V) means V – sync of the playback video signal.
- * REF – V (reference V) means V – sync used as the reference.
- * VLOCK means the signal generated when the PB – V and REF – V are in a certain range.

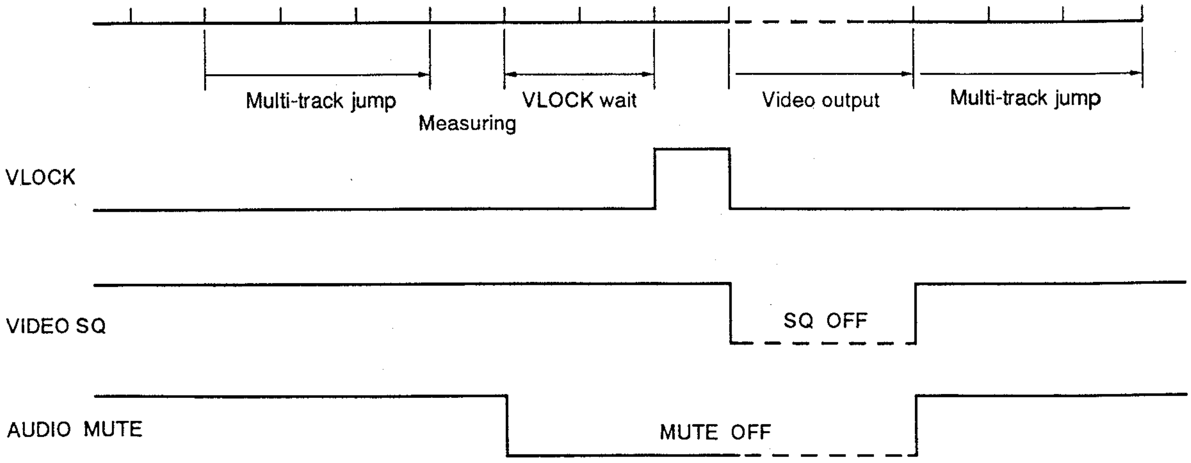
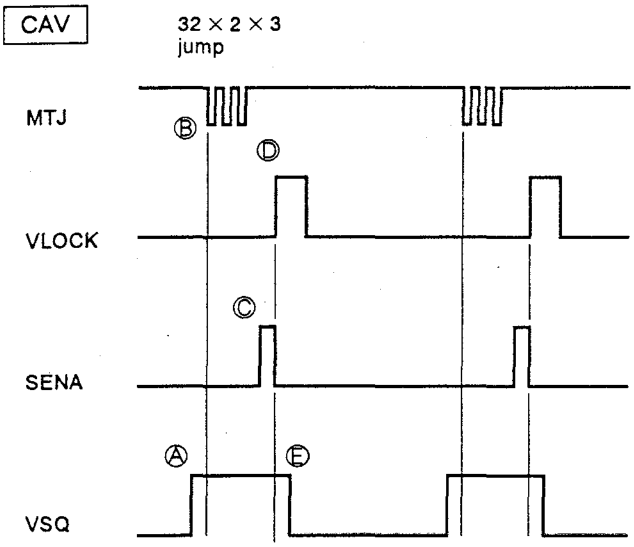


Fig. 8–8

● Timing Chart of the Clear Scan

CAV


32 × 2 × 3
jump
MTJ
VLOCK
SENA
VSQ
Ⓐ
Ⓑ
Ⓒ
Ⓓ
Ⓔ

The audio mute signal is applied at the same time with VSQ but is *canceled before VSQ is canceled.*

- Ⓐ :Activates video squelch.
- Ⓑ :Executes a multitrack jump 32 × 2 × 3.
- Ⓒ :Decreases Reference H to match the playback V-sync phase and the reference V-sync phase. Shift enable (SENA)ON.
- Ⓓ :As the phases have matched (VLOCK).
- Ⓔ :Cancels video squelch and plays the disc for a certain time.

CLV

Compared with CAV, a longer time is required to match the phases after a jump operation. Ⓒ

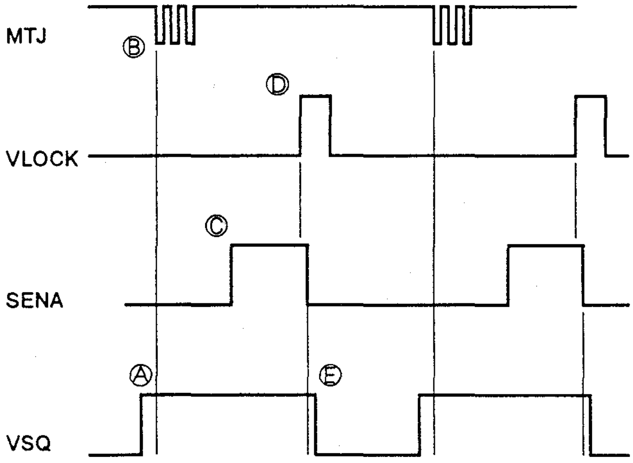
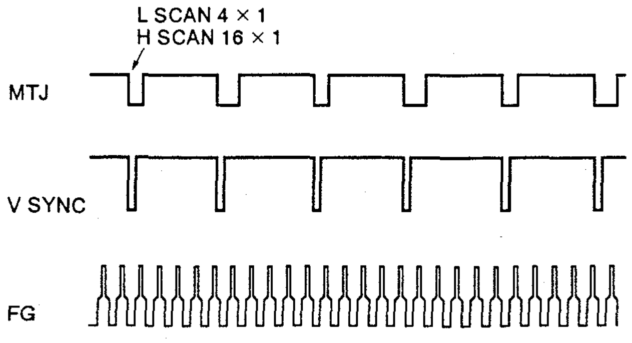

MTJ
VLOCK
SENA
VSQ
Ⓐ
Ⓑ
Ⓒ
Ⓓ
Ⓔ

Fig. 8—9

● Timing Chart of the Normal Scan

CAV

Performs a multitrack jump in synchronization with the playback V SYNC.


L SCAN 4 × 1
H SCAN 16 × 1
MTJ
V SYNC
FG

CLV

Performs a multitrack jump in synchronization with FG.

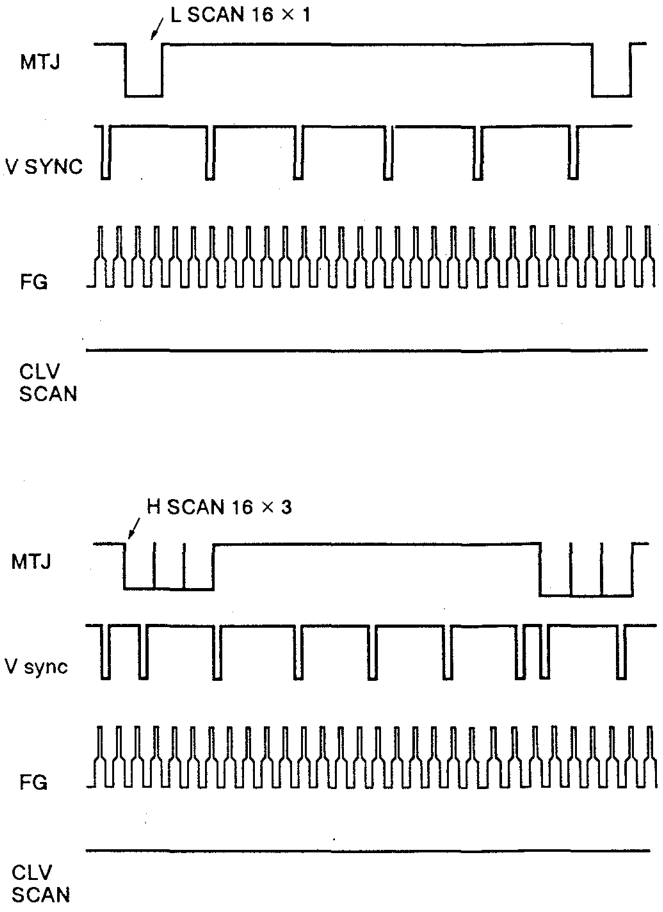

L SCAN 16 × 1
MTJ
V SYNC
FG
CLV
SCAN
H SCAN 16 × 3
MTJ
V sync
FG
CLV
SCAN

Fig. 8—10

8.4 FLOW CHARTS OF VARIOUS OPERATIONS

Flow from the tray-opening to tray-IN operations

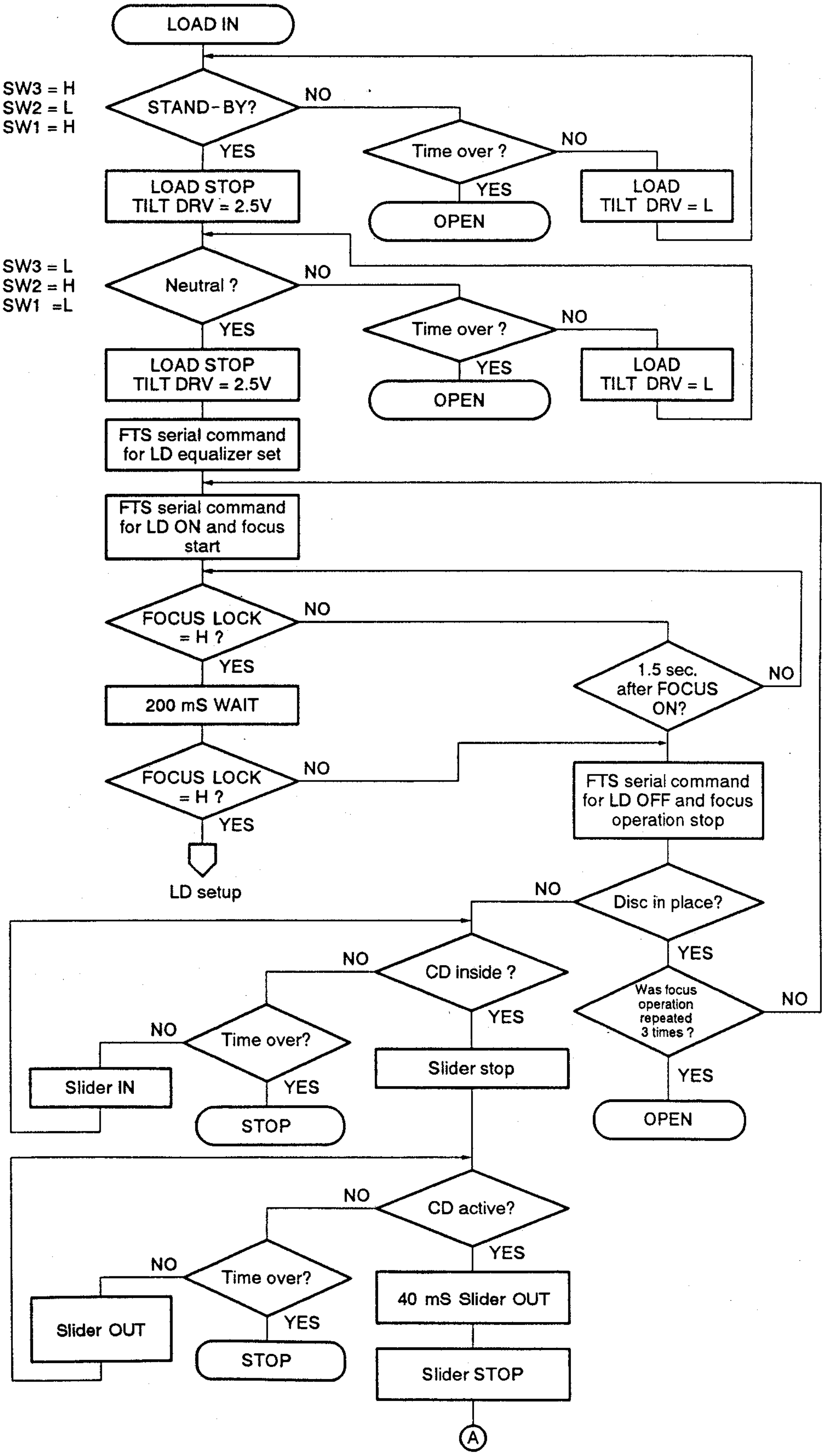

LOAD IN
SW3 = H
SW2 = L
SW1 = H
STAND-BY?
NO
YES
Time over ?
NO
YES
LOAD STOP
TILT DRV = 2.5V
OPEN
LOAD
TILT DRV = L
SW3 = L
SW2 = H
SW1 =L
Neutral ?
NO
YES
Time over ?
NO
YES
LOAD STOP
TILT DRV = 2.5V
OPEN
LOAD
TILT DRV = L
FTS serial command for LD equalizer set
FTS serial command for LD ON and focus start
FOCUS LOCK = H ?
NO
YES
1.5 sec. after FOCUS ON?
NO
200 mS WAIT
FOCUS LOCK = H ?
NO
YES
FTS serial command for LD OFF and focus operation stop
LD setup
NO
Disc in place?
YES
NO
CD inside ?
YES
Was focus operation repeated 3 times ?
NO
YES
NO
Time over?
YES
Slider IN
STOP
Slider stop
OPEN
NO
CD active?
YES
NO
Time over?
YES
40 mS Slider OUT
Slider OUT
STOP
Slider STOP
Ⓐ

Fig. 8—11

- From the state that the tray is open to the completion of the tray-IN operation.

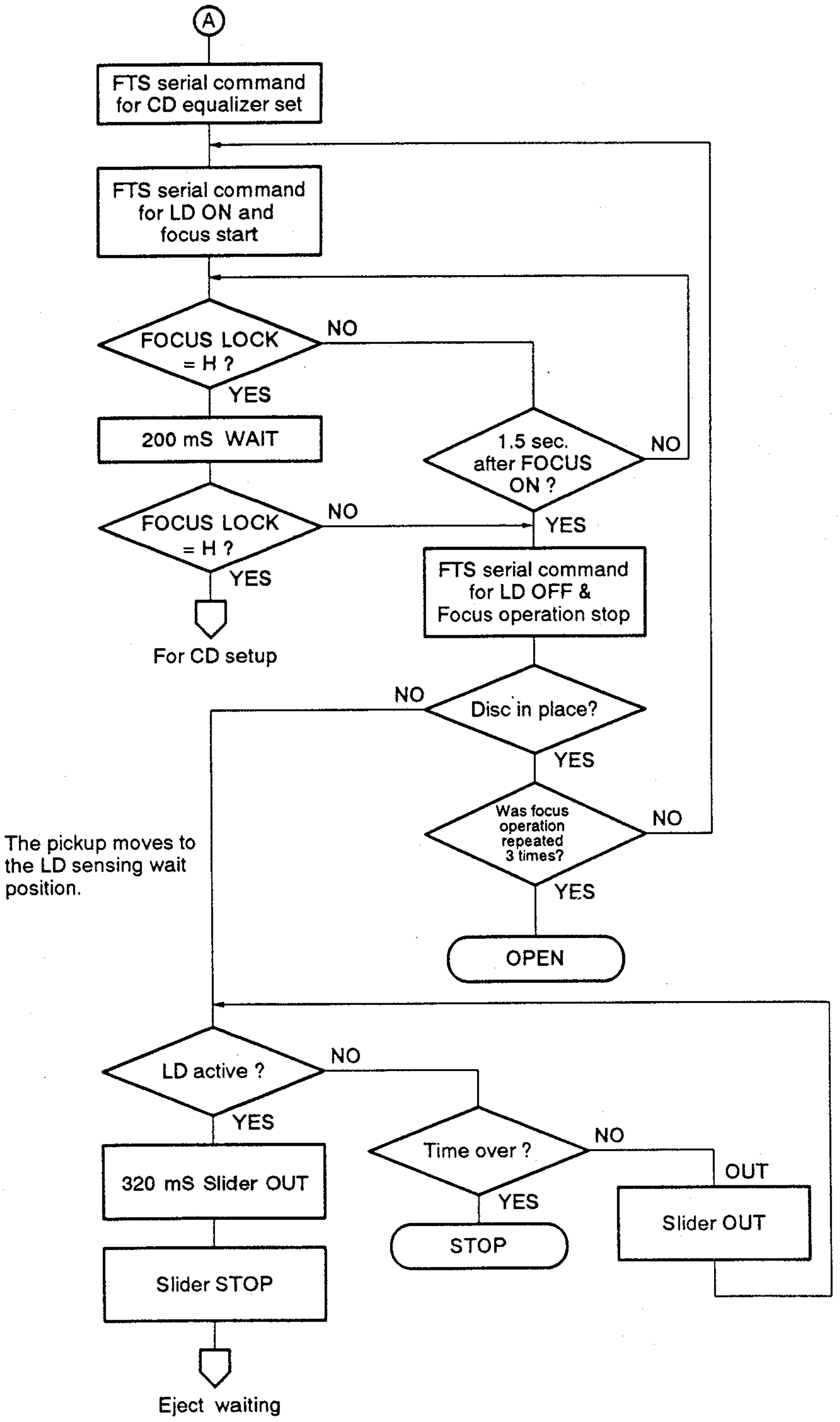
- If the loading operation does not enter the stand-by position with in five seconds, it is judged as an abnormal condition, and the tray opens.

- Clamp operation
  Timer = 10 seconds

- Pickup position in LD focusing ≒ around R65
  R:Distance from the center of the spindle motor.

- Judged as "Disc in place" when FOCUS LOCK becomes "L" during focus sweeping.
- If the focus is not locked even if focus sweeping is repeated three times with the disc in place, the tray opens, judging it to be an abnormal condition.
- Slider operation limit timer ≒ approx. 10 seconds.

- If the slider operation is not completed within a certain time, the operation stops and any key other than OPEN is not accepted.


A
FTS serial command for CD equalizer set
FTS serial command for LD ON and focus start
FOCUS LOCK = H ?
NO
YES
200 mS WAIT
1.5 sec. after FOCUS ON ?
NO
FOCUS LOCK = H ?
NO
YES
YES
FTS serial command for LD OFF & Focus operation stop
For CD setup
NO
Disc in place?
YES
Was focus operation repeated 3 times?
NO
The pickup moves to the LD sensing wait position.
YES
OPEN
LD active ?
NO
YES
Time over ?
NO
OUT
320 mS Slider OUT
YES
Slider OUT
STOP
Slider STOP
Eject waiting

- Pickup position for CD focusing ≒ R30
- CD focusing is the same as LD focusing.
  R:Distance from the center of the spindle motor.

- R65, the LD sensing position
  R:Distance from the center of the spindle motor.

- Timer for 10 seconds
  Timer indicates the time over.

Fig. 8—12

Flow of the LD Setup Operation

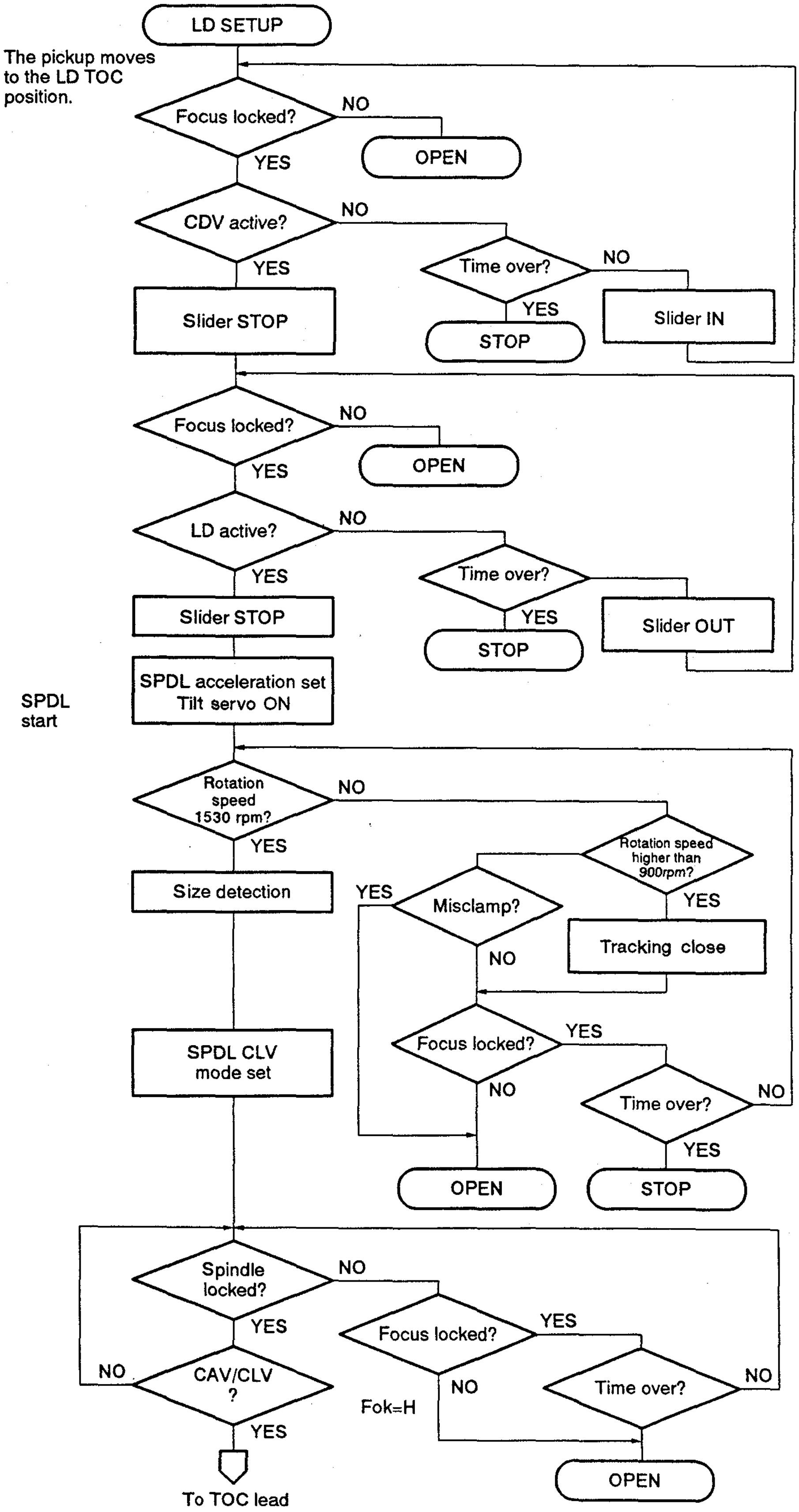

LD SETUP
The pickup moves to the LD TOC position.
Focus locked?
NO
YES
OPEN
CDV active?
NO
YES
Time over?
NO
YES
Slider STOP
STOP
Slider IN
Focus locked?
NO
YES
OPEN
LD active?
NO
YES
Time over?
YES
Slider STOP
STOP
Slider OUT
SPDL start
SPDL acceleration set
Tilt servo ON
Rotation speed 1530 rpm?
NO
YES
Rotation speed higher than 900rpm?
Size detection
YES
Misclamp?
YES
Tracking close
NO
SPDL CLV mode set
Focus locked?
YES
NO
Time over?
NO
YES
OPEN
STOP
Spindle locked?
NO
YES
Focus locked?
YES
NO
CAV/CLV ?
NO
Time over?
NO
Fok=H
YES
To TOC lead
OPEN

Fig. 8—13

- If focus is lost while the pickup is moving to the spindle startup position, the tray opens, judging it to be CD and LD disc-stacking error.
- Timer for approx. 10 seconds
  Timer indicates the time over.
- Timer for approx. 10 seconds.
- Tracking servo open mode is active until disc rotation exceeds 900 rpm.
- The disc rotation is forcibly accelerated until it reaches 1530 rpm, and the disc size is determined by the time required to reach 1200rpm.
- If 800 or more tracks are crossed in a single rotation of the disc, the tray opens, regarding it to be a misclamp.
- If focus is lost during the startup operation, the tray opens, assuming a damaged disc or the flip side of a single-sided disc.
- If the spindle is not locked within 60 seconds after beginning SPDL acceleration, the operation stops.

Player Operation Modes

MODE 1 — OPEN

Step	Operation			
0	Clears internal registers, sets the spindle to STOP and waits for focus OFF.			
1	Double side			Single side
	Side B	Side A	During α-turn	
	Starts tilt up	↓	Starts tilt down	↓
2	Wait for tilt up. Starts to move the slider B to the out side.		↓	↓
3	Waits for the spindle to stop.		↓	↓
4	Waits for the slider B to move the out side.		↓	↓
5	Starts clamp switching (B to A).		↓	↓
6	Waits for clamp switching (B to A).		↓	↓
7	Starts tilt down.		↓	↓
8	Wait for tilt down		↓	↓
9	Starts to move the slider to the LD sensing position.			
A	Waits for the spindle to stop.			
B	Waits for the slider to reach the LD sensing position.			
C	Starts unloading.			
D	Performs unloading until the OUT SW activates.			
E	Sets the 100 ms timer.			
F	Waits for 100 ms.			
10	Sets the OPEN mode.			
	Completed			

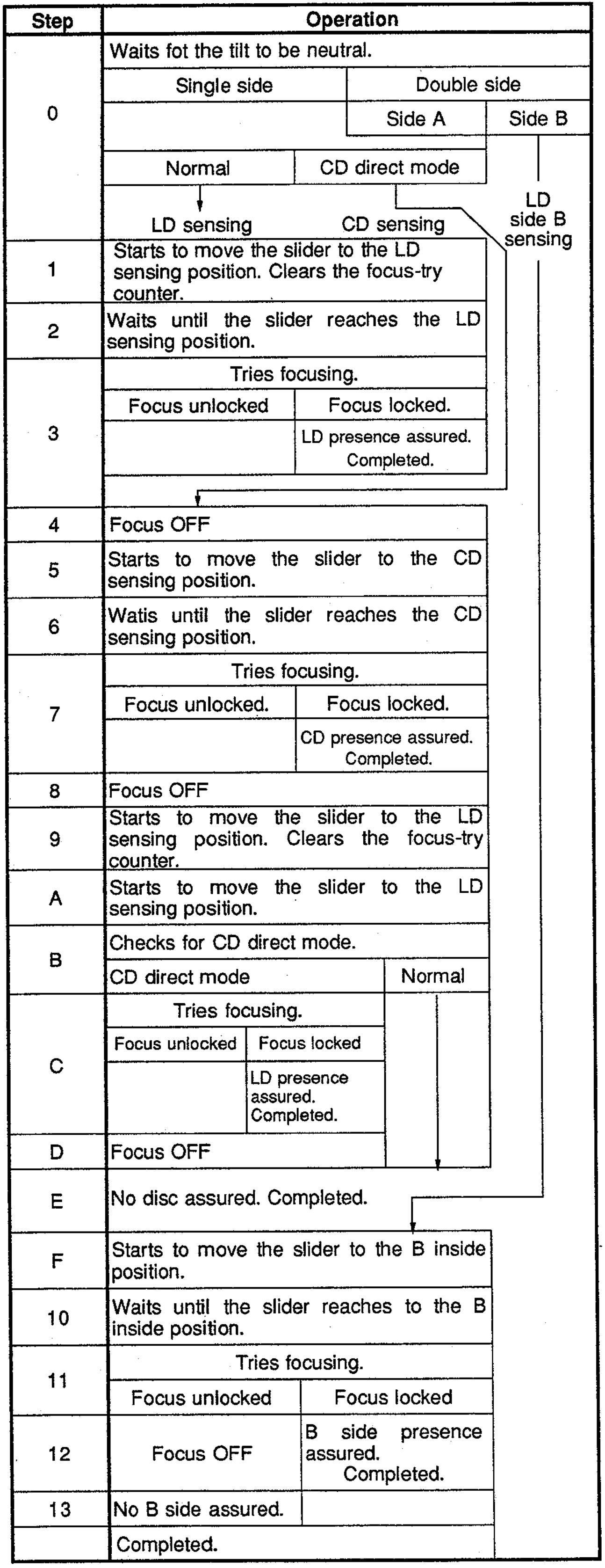
MODE 2 — STANDBY

Step	Operation			
0	Clears internal registers, sets the spindle to STOP and waits for focus OFF.			
1	Double side			Single side
	Side B	Side A	During α-turn	
	Starts tilt up	↓	Starts tilt down	↓
2	Wait for tilt up. Starts to move the slider B to the out side.		↓	↓
3	Waits for the spindle to stop.		↓	↓
4	Waits for the slider B to move the out side.		↓	↓
5	Starts clamp switching (B to A).		↓	↓
6	Waits for clamp switching (B to A).		↓	↓
7	Starts tilt down.		↓	↓
8	Wait for tilt down		↓	↓
9	Starts to move the slider to the LD sensing position.			
A	Waits for the spindle to stop.			
B	Waits for the slider to reach the LD sensing position.			
C	Starts to move the tilt to the neutral position.			
D	Waits for the tilt to reach the neutral positon.			
	Completed			

MODE 3 — STOP

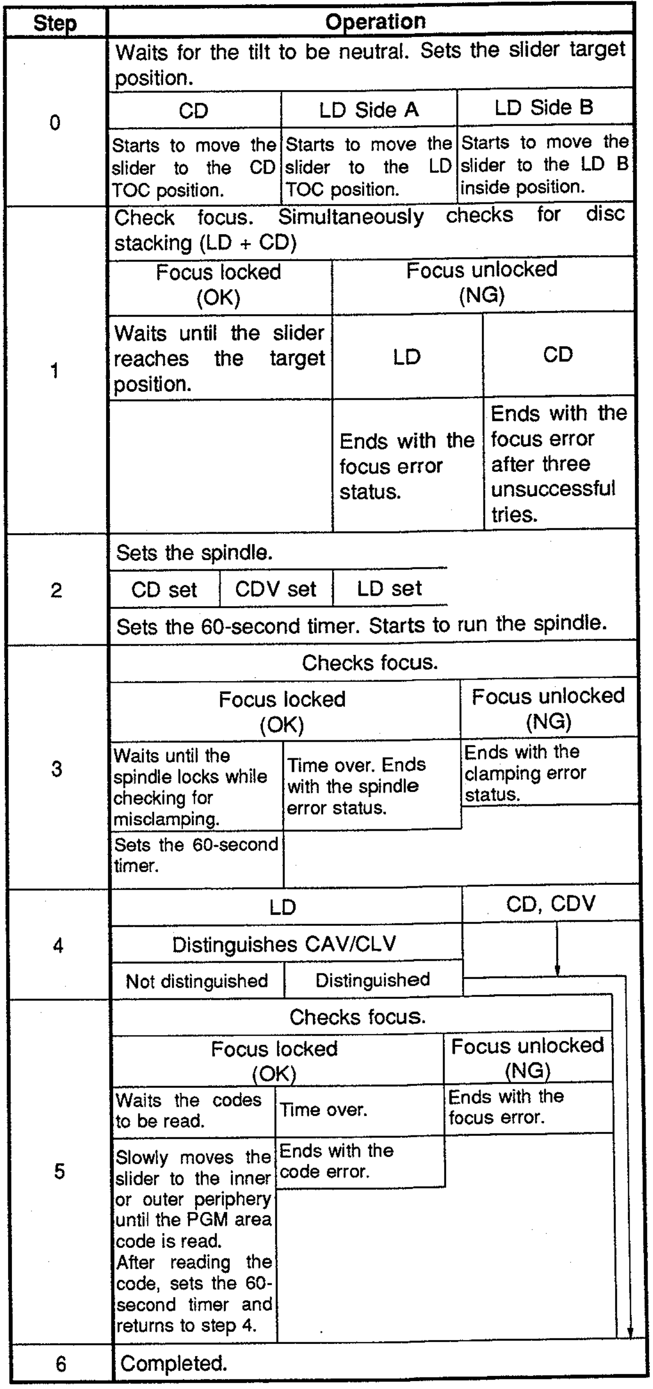
Step	Operation			
0	Clears internal registers, sets the spindle to STOP and waits for focus OFF.			
1	Double side			Single side
	Side B	Side A	During α-turn	
	Starts tilt up	↓	Starts tilt down	↓
2	Wait for tilt up. Starts to move the slider B to the out side.		↓	↓
3	Waits for the spindle to stop.		↓	↓
4	Waits for the slider B to move the out side.		↓	↓
5	Starts clamp switching (B to A).		↓	↓
6	Waits for clamp switching (B to A).		↓	↓
7	Starts tilt down.		↓	↓
8	Wait for tilt down		↓	↓
9	Starts to move the slider to the LD sensing position.			↓
A	Waits for the spindle to stop.			
B	Waits for the slider to reach the LD sensing position.			
C	Starts to move the tilt to the neutral position.			
D	↓			
E	Waits fot the tilt to reach the neutral position.			
	Completed			

MODE 4 — DISC SENSING



Step	Operation
0	Waits fot the tilt to be neutral. Single side / Double side: Side A / Side B Normal / CD direct mode LD sensing / CD sensing / LD side B sensing
1	Starts to move the slider to the LD sensing position. Clears the focus-try counter.
2	Waits until the slider reaches the LD sensing position.
3	Tries focusing. Focus unlocked / Focus locked. LD presence assured. Completed.
4	Focus OFF
5	Starts to move the slider to the CD sensing position.
6	Watis until the slider reaches the CD sensing position.
7	Tries focusing. Focus unlocked. / Focus locked. CD presence assured. Completed.
8	Focus OFF
9	Starts to move the slider to the LD sensing position. Clears the focus-try counter.
A	Starts to move the slider to the LD sensing position.
B	Checks for CD direct mode. CD direct mode / Normal
C	Tries focusing. Focus unlocked / Focus locked LD presence assured. Completed.
D	Focus OFF
E	No disc assured. Completed.
F	Starts to move the slider to the B inside position.
10	Waits until the slider reaches to the B inside position.
11	Tries focusing. Focus unlocked / Focus locked
12	Focus OFF / B side presence assured. Completed.
13	No B side assured.
	Completed.

MODE 5 — SETUP



Step	Operation
0	Waits for the tilt to be neutral. Sets the slider target position. CD: Starts to move the slider to the CD TOC position. LD Side A: Starts to move the slider to the LD TOC position. LD Side B: Starts to move the slider to the LD B inside position.
1	Check focus. Simultaneously checks for disc stacking (LD + CD) Focus locked (OK): Waits until the slider reaches the target position. Focus unlocked (NG): LD: Ends with the focus error status. / CD: Ends with the focus error after three unsuccessful tries.
2	Sets the spindle. CD set / CDV set / LD set Sets the 60-second timer. Starts to run the spindle.
3	Checks focus. Focus locked (OK): Waits until the spindle locks while checking for misclamping. Sets the 60-second timer. / Time over. Ends with the spindle error status. Focus unlocked (NG): Ends with the clamping error status.
4	LD: Distinguishes CAV/CLV Not distinguished / Distinguished CD, CDV
5	Checks focus. Focus locked (OK): Waits the codes to be read. Slowly moves the slider to the inner or outer periphery until the PGM area code is read. After reading the code, sets the 60-second timer and returns to step 4. / Time over. Ends with the code error. Focus unlocked (NG): Ends with the focus error.
6	Completed.

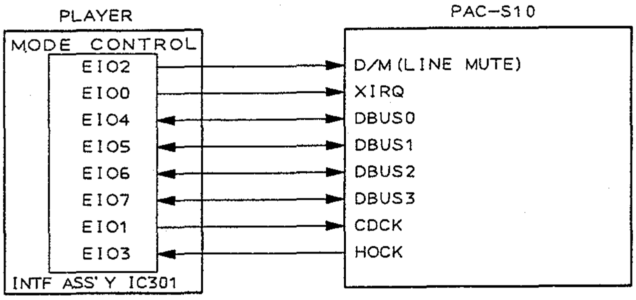
MODE 6 — TOC READ

Step	Operation		
0	Diverges depending on the disc type.		
	LD		CD, CDV
	Clears 1st address. Sets the 15-second timer.		
1	Moves to the lead-in area and checks the focus time.		
	A 24-bit code read.		Not read
	Lead-in area	PGM area, lead-out area.	
	↓	32-track REV jump	Playback
2	Moves to the PGM area and checks the focus time.		
	A 24-bit code read.		Not read
	PGM area	Lead-in area	
	↓	16-track FWD jump	Playback
3	Moves to the lead-in area and checks the focus time.		
	A 24-bit code read.		Not read
	Lead-in area	PGM area	
	↓	4-track REV jump	Playback
4	Plays to the PGM area and checks the focus time.		
	A 24-bit code read.		Not read
	PGM area	Lead-in	
	Stes the 0.5-second timer. ↓	Playback	
5	Stores the 1st address (CH, time) in memory and checks the focus time.		
	After 0.5 seconds, checks for the CH and the seconds.		
	Sets the 0.5-second timer ↓		
6	Checks fot TOC (subcodes) and checks the focus time.		
	TOC available ↓	Ends with no TOC if no subcode can be read in 0.5 seconds.	
7	Sets the 15-second timer.		
8	Waits until TOC is read.	Time over.	TOC reading completed.
	PGM area	Lead-in area. Subcode NG.	Ends.
	↓	Playback	
9	Subcode OK and focus check NG.		
	32-track REV jump ↓	Playback	
A	Subcode OK and focus check NG.		
	32-track REV jump ↓	Playback	
B	Subcode OK and focus check NG.		
	32-track REV jump ↓	Playback	
C	Subcode OK and focus check NG.		
	32-track REV jump ↓	Playback	
D	Returns to step 8.		
E	CD-R backup	Starts to move the PGM area. CD-R identified.	
F		Move to the PGM area. Confirmed.	
10		Ends with the code error.	Time over. Ends with no TOC.
11	Moves to the user code reading area.		
12	Checks user code.		

MODE 8 — SEARCH

Step	Operation			
0	Focus ON		Focus OFF	
	Sets the 15-second timer		Ends with the recovery error.	
	Diverges dipending on disc, search target or playing game.			
	CDV		CD, CAV, CLV	
	A→V V→A	A→A V→V		
	↓	CD, CDV CAV frame search CLV time search (During game)	CAV chapter search CLV chapter search CLV time search (Not during game)	
1	Clears the focus-try counter and starts to the spindle STOP operation. Starts to move the slider.			
	To A→V CDV TOCposition.	To V→A CD TOC position		
2	Waits until the slider reaches the specified position.			
	Waits for spindle STOP. →Ends with the disc stack (clamp) error if the spindle does not stop in 1.6 seconds.			
	Focus locked (Sets the 15-seconds timer.)		Tries focusing.	
	Sets the spindle for CD audio.	Sets the spindle for CDV video.	Ends with the recovery error after four unsuccessful tries.	
3	Waits until the spindle locks.			
	Waits until the subcode is read. ↓			
4	If the disc is CDV, go to step 9..			After search is completed, sets the 5 -seconds timer. CD →step E Other →step C
	Sets the 20-times track counter.			
	Less than 256 track or CLV→step 6. Others→step 7.		More than 256 track →step 5.	
5	Performs track counter searching.			
		Less than 256 track→step 6.	CLV→step 7.	
6	Performs multi-track jump searching.			
		When not playing game →step 9	Less than 32 track of CAV, performs 1-track jump searching.	
7	Drives the slider to cross the target address. (CAV: High speed, Other: Mid speed)			
8	Drives the slider to cross the target address.(Low speed)			
9	Performs 32-track jumps to cross the target address.			
A	Performs 4-track jumps to cross the target address.			
B	Performs 4-track jumps to reach the front of the target address. Sets the timer and goes to step C			Time check NG→Ends with the search error.
C	Plays until the target address is reached.			
			CD,CDV-A	
	Spindle locked.	Unlocked	REV 1 jump	
	Game | Not Game	Go to step B.		
	REV 2 jump. Go step 10. | REV 1 jump. Go step E.		↓	
D	Performs 4-track jumps to a point before the target address. Sets the timer and goes to step E.			Time check NG→Ends with the search error.
E	Plays until the target address is reached.			Time check NG→Ends with the search error.
	During game and except CD, sets REV 2-track jump and goes to step 10.			
F	If another new search target is specified during search, waits the spindle to lock and returns to step 0.			
10	Plays until the target address is reached. Then, goes to step 11.			Time check NG→Ends with the search error.
11	If the operation is lead-in search, backs 32-track and goes to step 12. If not, completed.			
12	Performs 32-track back jump, goes to step 13.			
13	Lead-in area→Search completed. PGM area→Returns to step 7 to start searching one more times.			

8.5 INTERFACE BETWEEN THE PLAYER AND PAC−S10 PLAYER


PLAYER
PAC−S10
MODE CONTROL
EIO2
EIO0
EIO4
EIO5
EIO6
EIO7
EIO1
EIO3
INTF ASS'Y IC301
D/M (LINE MUTE)
XIRQ
DBUS0
DBUS1
DBUS2
DBUS3
CDCK
HOCK

※ The mode controller receives commands from the PAC − S10.

Fig. 8 − 14

<Mode Controller and PAC − S10 Communication Process>

As a data bus (DBUS 0 to 3), the communications board sends and receives 4 − bit parallel signals. During CD playback, communications occur every 13.3msec according to the sync signal. During LD playback, it occurs every 16.6msec according to the sync signal. At other times, it occurs every 20msec (approx.) according to the mode controller's timer.

The 5 − byte (10 nibbles) data is sent according to the following process :

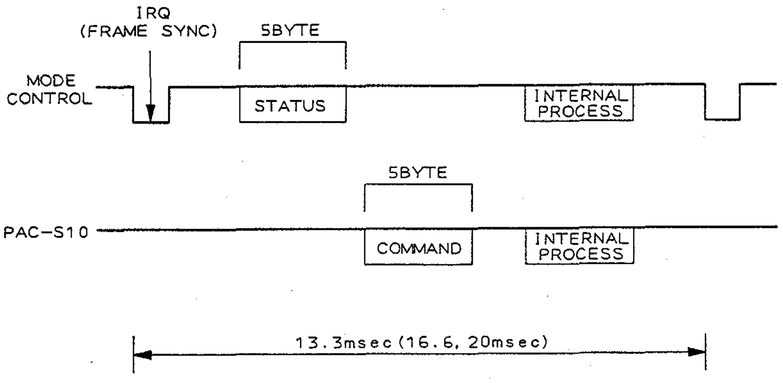
① Mode Controller → PAC − S10

- Response to a command received from PAC − S10 in the preceding transmission.
- Current status (including errors) of the mode controller.
- Transmission of the player's current status (response to a report specification). Since the PAC − S10 monitors the status disclosed by the mode controller, the player operates as desired according to whether the issued command has been received or whether an error has occurred. Such information can be obtained.

② PAC − S10 → Mode controller (1 nibble = 4 bits)

- Command which controls the player.
- Report specification which reports the player's status.

The general communications flow is shown below. (Fig 8−15)


IRQ
(FRAME SYNC)
5BYTE
MODE CONTROL
STATUS
INTERNAL PROCESS
5BYTE
PAC−S10
COMMAND
INTERNAL PROCESS
13.3msec (16.6, 20msec)

<PLAYER and PAC−S10 COMMUNICATION TIMING>

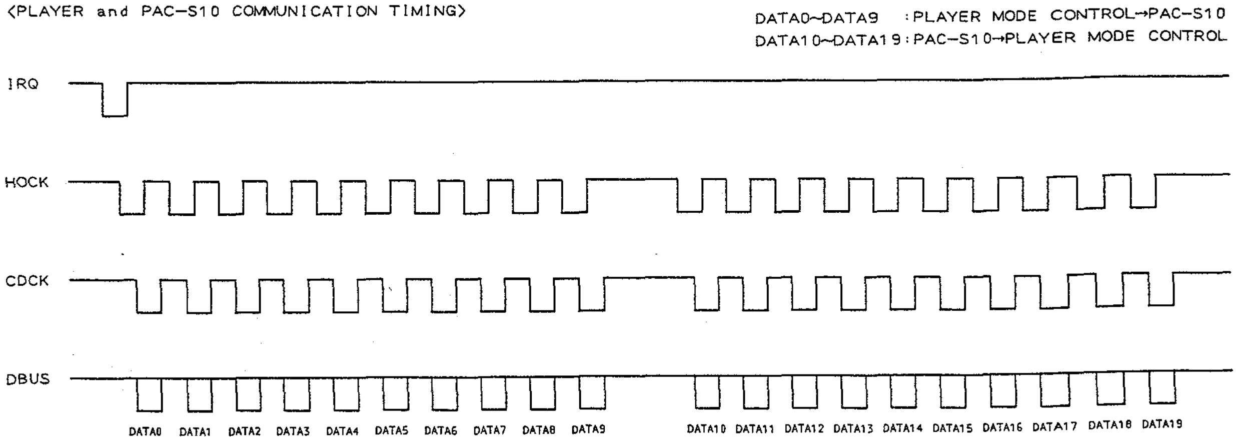
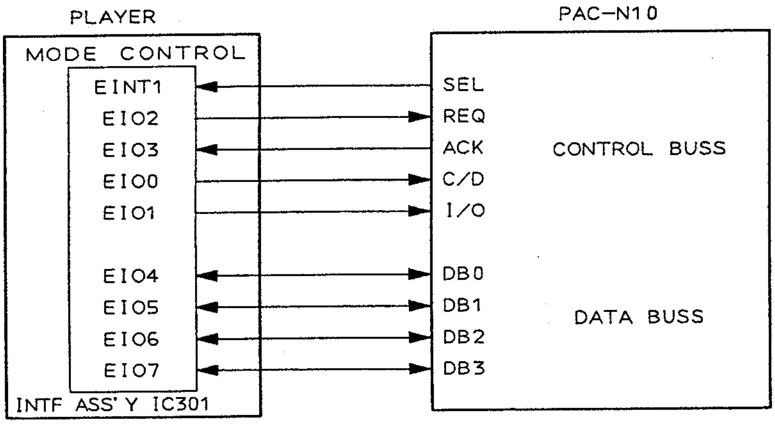

DATA0∼DATA9 : PLAYER MODE CONTROL→PAC−S10
DATA10∼DATA19 : PAC−S10→PLAYER MODE CONTROL
IRQ
HOCK
CDCK
DBUS
DATA0
DATA1
DATA2
DATA3
DATA4
DATA5
DATA6
DATA7
DATA8
DATA9
DATA10
DATA11
DATA12
DATA13
DATA14
DATA15
DATA16
DATA17
DATA18
DATA19

Fig. 8 − 15

8.6 INTERFACE BETWEEN THE PLAYER AND PAC-N10


PLAYER
PAC-N10
MODE CONTROL
EINT1
EIO2
EIO3
EIO0
EIO1
EIO4
EIO5
EIO6
EIO7
INTF ASS'Y IC301
SEL
REQ
ACK
C/D
I/O
CONTROL BUSS
DB0
DB1
DB2
DB3
DATA BUSS

※The control bus is Low Active, and the data bus is High Active.

Fig. 8-16

The operating request from the PAC-N10 to the player starts with the SEL from PAC-N10.
When the player responds with REQ, PAC-N10 issues a 4-byte command.
By giving a 1-byte status to PAC-N10, the player completes a command operation.
Even while a command is still being executed, the player will issue a new command after receiving SEL from PAC-N10.
If this happens, the preceding status will be cleared entirely.
Commands, data, status, etc., are transferred via the REQ/ACK handshake.

<PLAYER and PAC-N10 COMMUNICATION TIMING>

A command operation

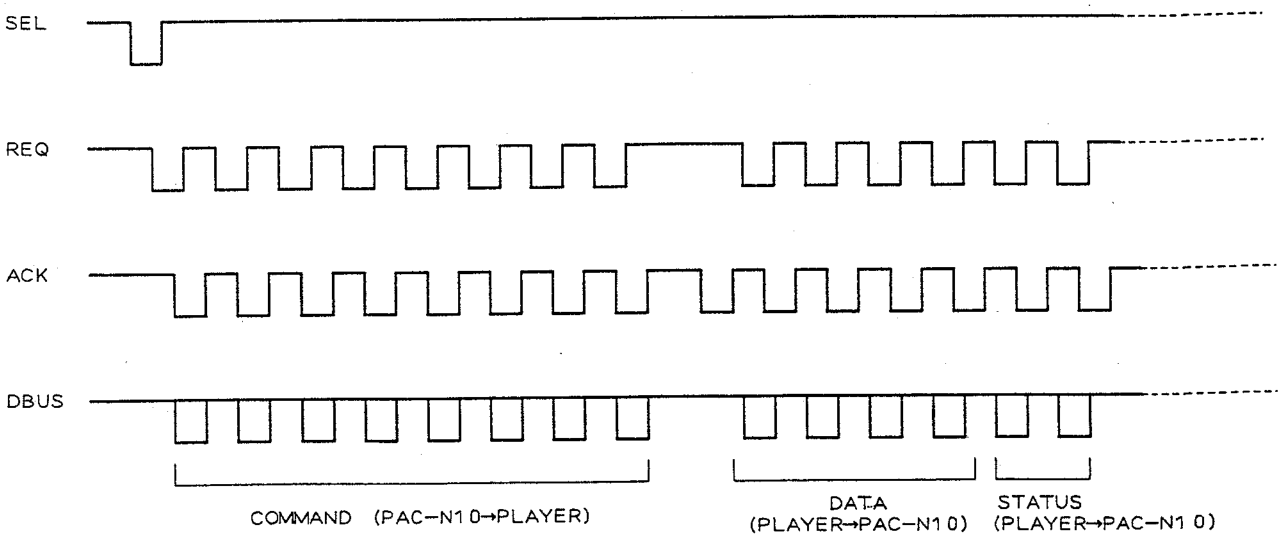

SEL
REQ
ACK
DBUS
COMMAND (PAC-N10→PLAYER)
DATA (PLAYER→PAC-N10)
STATUS (PLAYER→PAC-N10)

Fig. 8-17

8.7 INTERFACE BETWEEN THE PLAYER AND PAC-K1

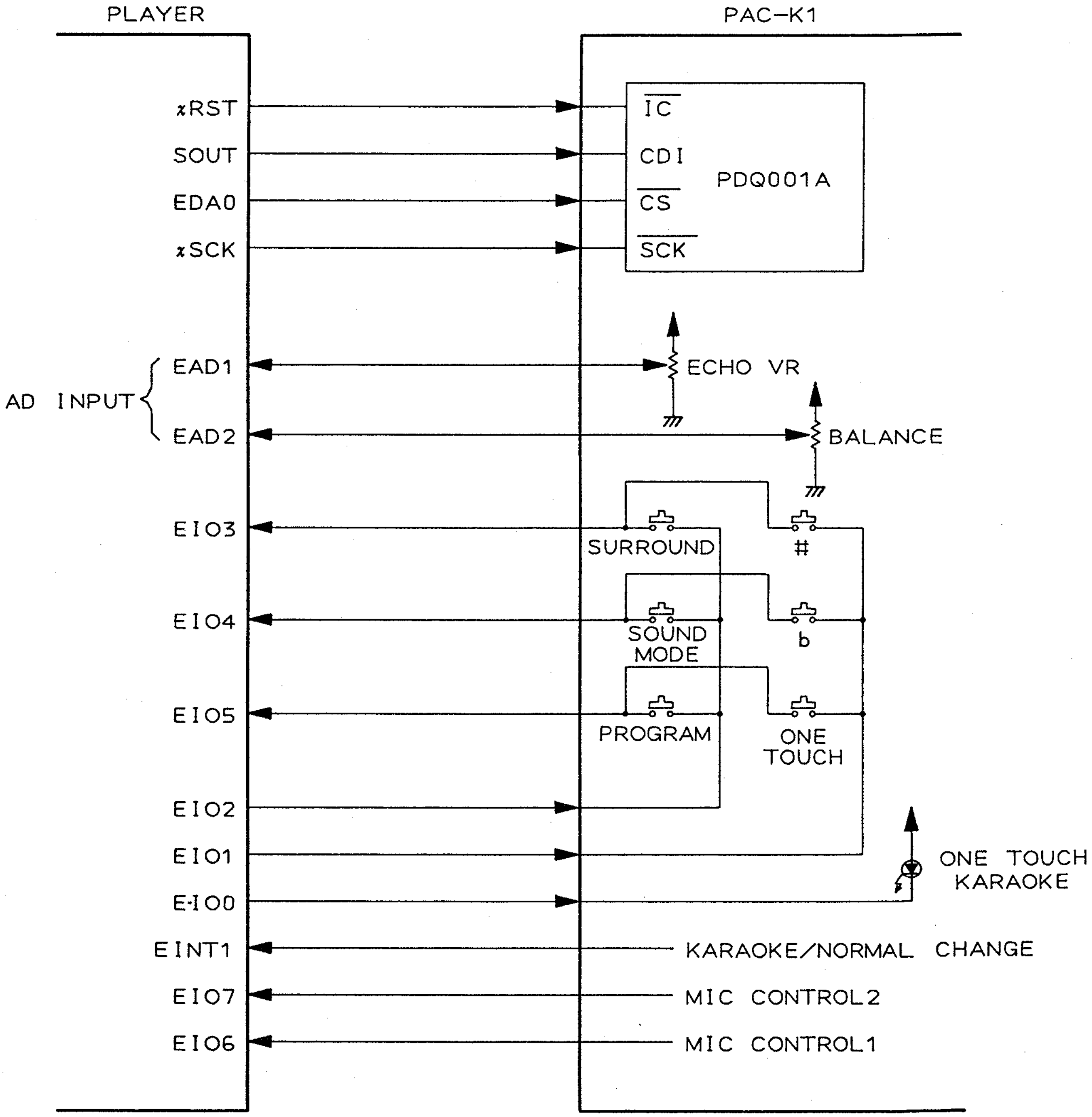

PLAYER
PAC-K1
*RST
SOUT
EDA0
*SCK
IC
CDI
CS
SCK
PDQ001A
AD INPUT
EAD1
EAD2
ECHO VR
BALANCE
EIO3
EIO4
EIO5
EIO2
EIO1
E-IO0
EINT1
EIO7
EIO6
SURROUND
#
SOUND MODE
b
PROGRAM
ONE TOUCH
ONE TOUCH KARAOKE
KARAOKE/NORMAL CHANGE
MIC CONTROL2
MIC CONTROL1

Fig. 8–18

• Microcomputer interface timing chart

a. For address in $0000 to $0005

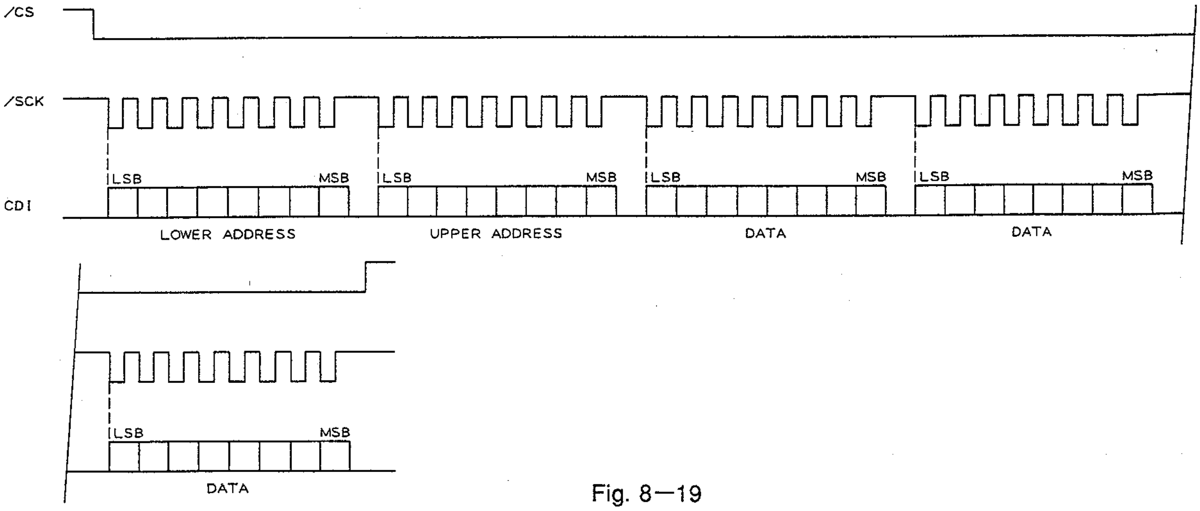

/CS
/SCK
CDI
LSB
MSB
LOWER ADDRESS
UPPER ADDRESS
DATA
DATA
DATA

Fig. 8—19

b. For addresses starting from $0040

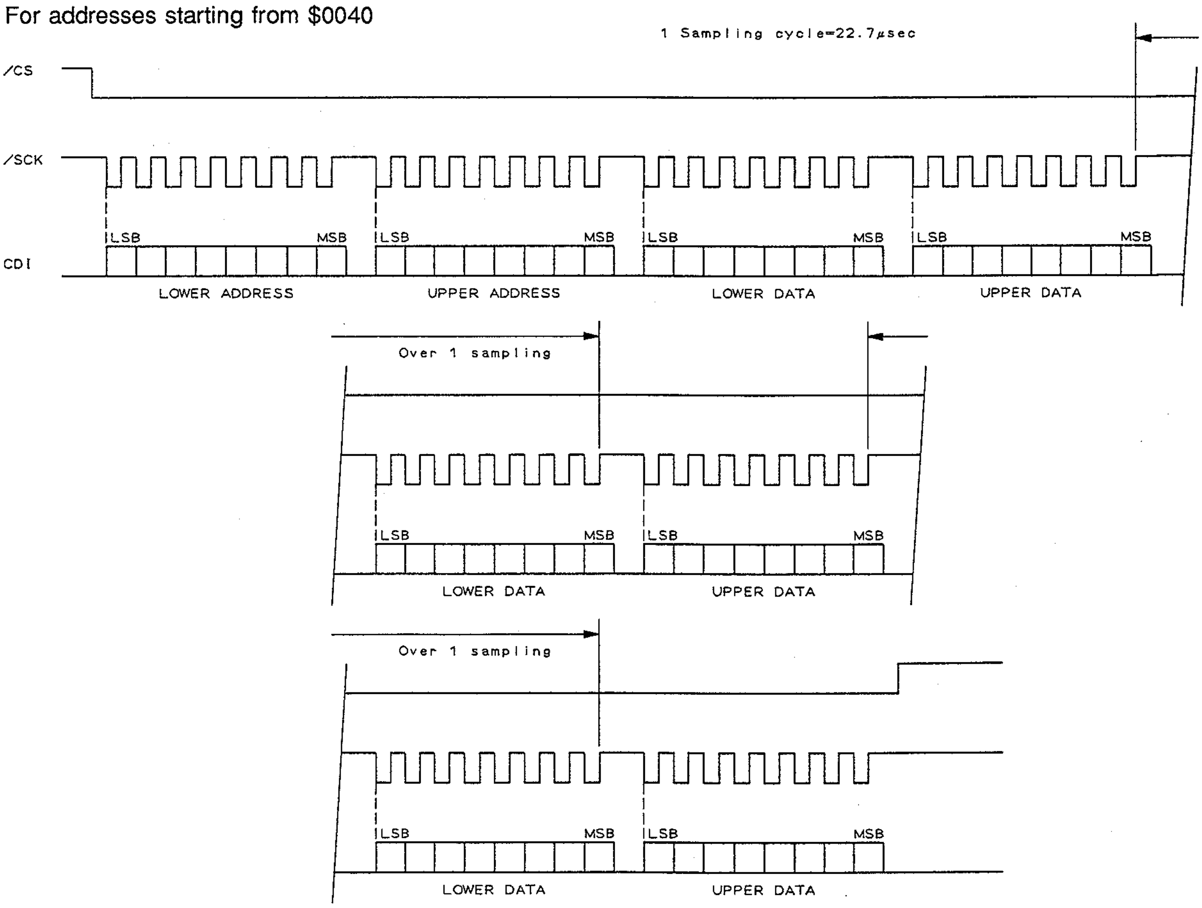

1 Sampling cycle=22.7μsec
/CS
/SCK
CDI
LSB
MSB
LOWER ADDRESS
UPPER ADDRESS
LOWER DATA
UPPER DATA
Over 1 sampling
LOWER DATA
UPPER DATA
Over 1 sampling
LOWER DATA
UPPER DATA

Fig. 8—20

The parameters for the DSP's resistor are set by sending the addresses and data.
After/CS is set to "L" the resistor's address is set for the first and second byte, and the data is set for the third byte and thereafter. The third byte's data is sent to the resistor that was set with the first and second bytes. The fourth byte's data is sent to the resistor whose address is one above (plus one) the address of the resistor set with the first and second bytes.
For each byte of data sent, the address of the resistor set with the first and second bytes will be incremented.
Therefore, continuous addresses can be set just by sending the data. After the setting is completed, /CS will become "H."

c. Data transmission to non-continuous addresses

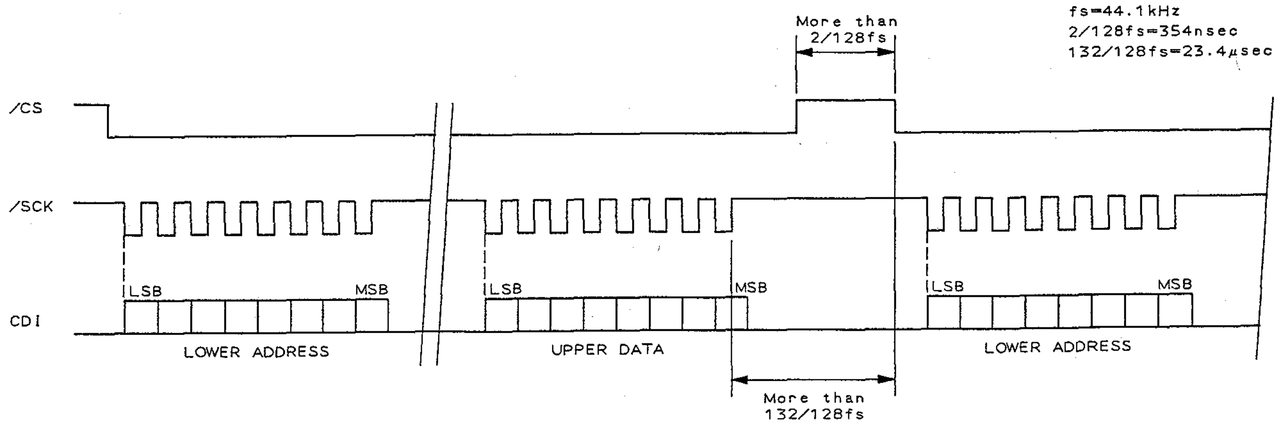
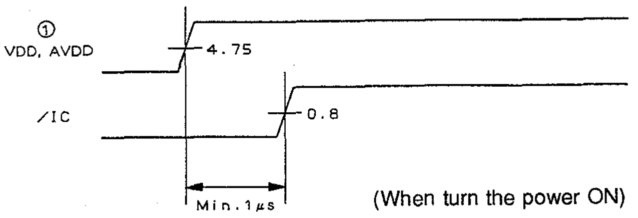

More than 2/128fs
fs=44.1kHz
2/128fs=354nsec
132/128fs=23.4μsec
/CS
/SCK
CDI
LSB
MSB
LOWER ADDRESS
UPPER DATA
LOWER ADDRESS
More than 132/128fs

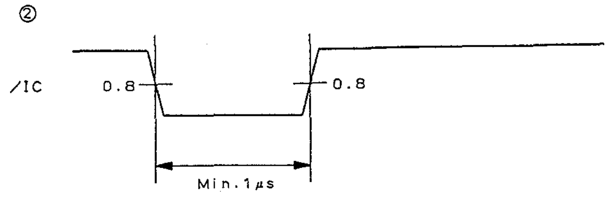
Fig. 8—21

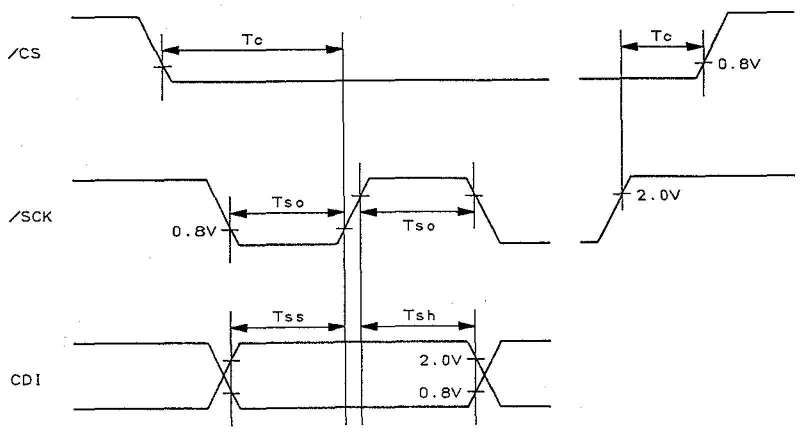
When data is sent to non-continuous addresses, the timing shown in Fig. 8—21 above will take effect.

d. /IC terminals "L" period required for initial clearing


①
VDD, AVDD
4.75
/IC
0.8
Min.1μs

(When turn the power ON)


②
/IC
0.8
0.8
Min.1μs


/CS
Tc
Tc
0.8V
/SCK
Tso
Tso
0.8V
2.0V
CDI
Tss
Tsh
2.0V
0.8V

Tc	More than 1/50fs	=454nsec
Tso	More than 1/50fs	=454nsec
Tss	More than 1/100fs	=227nsec
Tsh	More than 1/100fs	=227nsec

*fs=44.1kHz

Fig. 8—22

8.8 PACK IDENTIFICATION FLOWCHART

· POWER OFF → POWER ON → PACK IDENTIFICATION

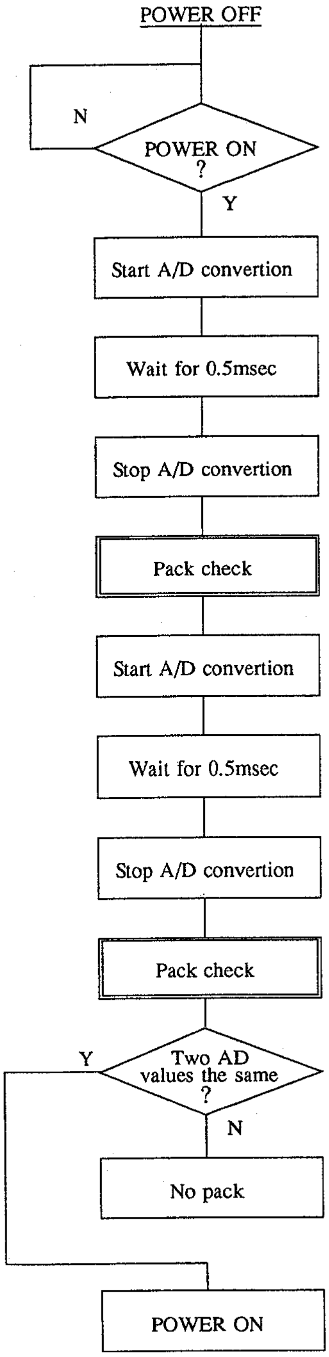
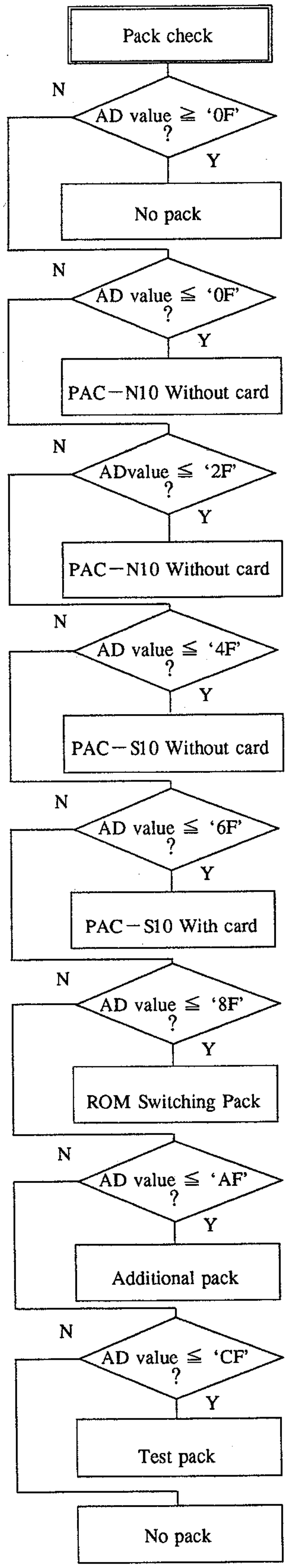

POWER OFF
N
POWER ON ?
Y
Start A/D convertion
Wait for 0.5msec
Stop A/D convertion
Pack check
Start A/D convertion
Wait for 0.5msec
Stop A/D convertion
Pack check
Y
Two AD values the same ?
N
No pack
POWER ON

Fig. 8—23


Pack check
N
AD value ≧ '0F' ?
Y
No pack
N
AD value ≦ '0F' ?
Y
PAC—N10 Without card
N
ADvalue ≦ '2F' ?
Y
PAC—N10 Without card
N
AD value ≦ '4F' ?
Y
PAC—S10 Without card
N
AD value ≦ '6F' ?
Y
PAC—S10 With card
N
AD value ≦ '8F' ?
Y
ROM Switching Pack
N
AD value ≦ 'AF' ?
Y
Additional pack
N
AD value ≦ 'CF' ?
Y
Test pack
No pack

Currently, karaoke pack only

Spare for future use

For testing on the production line

Fig. 8—24

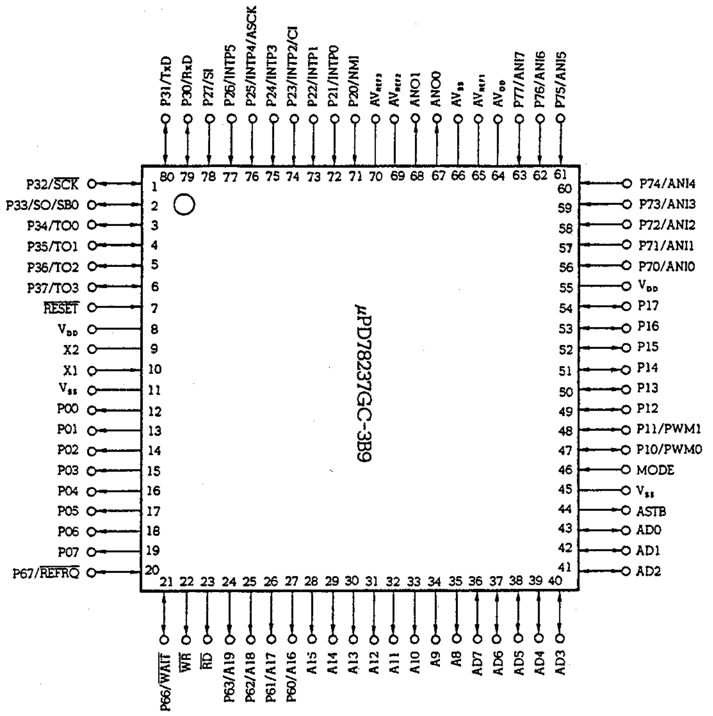
9. IC INFORMATION

■μPD78237GC−3B9 (INTF ASS'Y IC301)

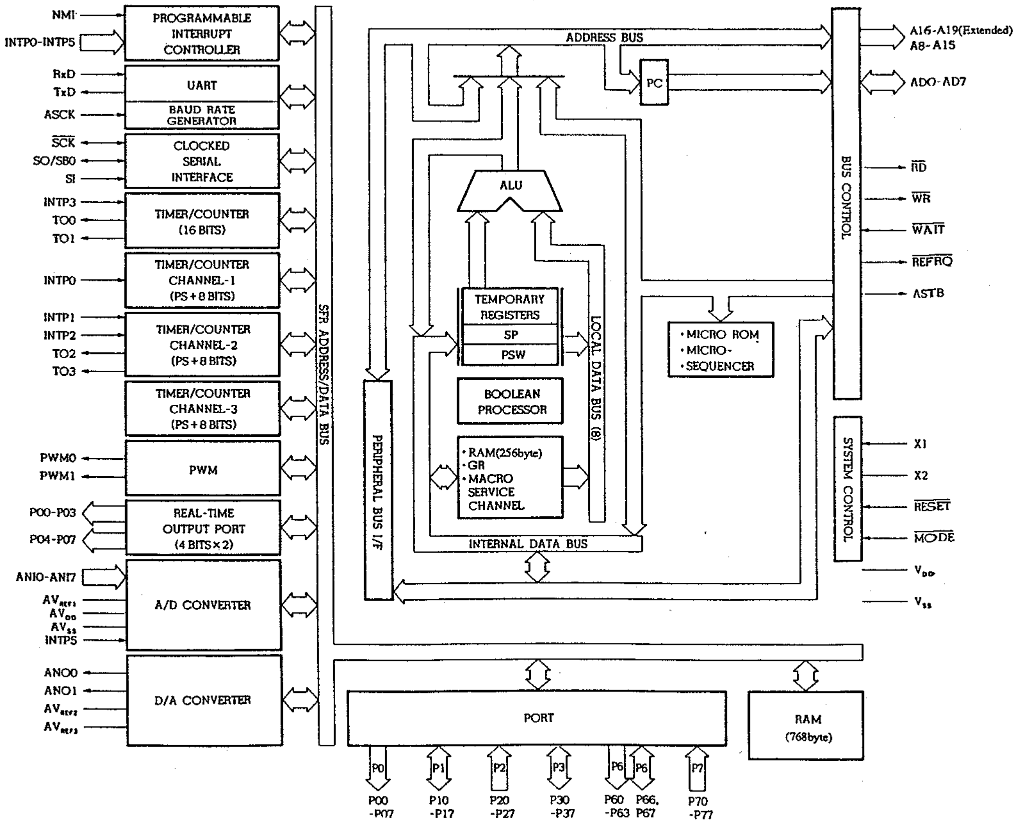
● Mode control IC

- The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

● Pin Assignment (Top view)


P31/TxD
P30/RxD
P27/SI
P26/INTP5
P25/INTP4/ASCK
P24/INTP3
P23/INTP2/CI
P22/INTP1
P21/INTP0
P20/NMI
AV_REF3
AV_REF2
ANO1
ANO0
AV_SS
AV_REF1
AV_DD
P77/ANI7
P76/ANI6
P75/ANI5
80 79 78 77 76 75 74 73 72 71 70 69 68 67 66 65 64 63 62 61
P32/SCK 1
P33/SO/SB0 2
P34/TO0 3
P35/TO1 4
P36/TO2 5
P37/TO3 6
RESET 7
V_DD 8
X2 9
X1 10
V_SS 11
P00 12
P01 13
P02 14
P03 15
P04 16
P05 17
P06 18
P07 19
P67/REFRQ 20
μPD78237GC-3B9
60 P74/ANI4
59 P73/ANI3
58 P72/ANI2
57 P71/ANI1
56 P70/ANI0
55 V_DD
54 P17
53 P16
52 P15
51 P14
50 P13
49 P12
48 P11/PWM1
47 P10/PWM0
46 MODE
45 V_SS
44 ASTB
43 AD0
42 AD1
41 AD2
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
P66/WAIT
WR
RD
P63/A19
P62/A18
P61/A17
P60/A16
A15
A14
A13
A12
A11
A10
A9
A8
AD7
AD6
AD5
AD4
AD3

● Block Diagram


NMI
INTP0-INTP5
PROGRAMMABLE INTERRUPT CONTROLLER
RxD
TxD
ASCK
UART
BAUD RATE GENERATOR
SCK
SO/SB0
SI
CLOCKED SERIAL INTERFACE
INTP3
TO0
TO1
TIMER/COUNTER (16 BITS)
INTP0
TIMER/COUNTER CHANNEL-1 (PS+8 BITS)
INTP1
INTP2
TO2
TO3
TIMER/COUNTER CHANNEL-2 (PS+8 BITS)
TIMER/COUNTER CHANNEL-3 (PS+8 BITS)
PWM0
PWM1
PWM
P00-P03
P04-P07
REAL-TIME OUTPUT PORT (4 BITS×2)
ANI0-ANI7
AV_REF1
AV_DD
AV_SS
INTP5
A/D CONVERTER
ANO0
ANO1
AV_REF2
AV_REF3
D/A CONVERTER
SFR ADDRESS/DATA BUS
PERIPHERAL BUS I/F
ADDRESS BUS
PC
ALU
TEMPORARY REGISTERS
SP
PSW
LOCAL DATA BUS (8)
BOOLEAN PROCESSOR
•RAM(256byte)
•GR
•MACRO SERVICE CHANNEL
INTERNAL DATA BUS
•MICRO ROM
•MICRO-
•SEQUENCER
BUS CONTROL
A16-A19(Extended)
A8-A15
AD0-AD7
RD
WR
WAIT
REFRQ
ASTB
SYSTEM CONTROL
X1
X2
RESET
MODE
V_DD
V_SS
PORT
RAM (768byte)
P0
P1
P2
P3
P6
P6
P7
P00 -P07
P10 -P17
P20 -P27
P30 -P37
P60 -P63
P66, P67
P70 -P77

●Pin Function

No.	Pin name	I/O	Function
1	XSCK	I/O	Serial communication clock
2	SO	O	Serial communication transmission data
3	GVIDEO	O	Switching game display only or LD and game display overlay H : Game only L : Overlay
4	N.C.	I	Not used
5	EIO 8	I	Detect pack category H : Normal L : Not defined
6	XROMEXT	O	Select Mode control ROM H : Main unit L : Inside Pack
7	XRESET	I	Reset input
8	VDD	–	Standard power supply
9	X_2	–	System clock
10	X_1	I	
11	Vss	–	GND
12	W.D.F	O	Pulse output for watchdog timer
13	XCS	O	Character generator chip select
14	XRESETO	O	Reset output
15	POWER ON	O	Switched 5V ON/OFF H : ON L : OFF
16	LED 0	O	PLAY LED drive output
17	LED 1	O	MEMORY LED drive output
18	LED 2	O	STANDBY/POWER LED drive output
19	LED 3	O	LD LED drive output
20	ACK	I/O	Communication handshake timing clock with mechanism control
21	XWAIT	I	Read/Write wait timing clock with external memory
22	XWR	O	Write strobe with external memory
23	XRD	O	Read strobe with external memory
24	PACKDET	O	Pack detect H : with Pack L : without Pack
25	SEGAMUTE	O	Digital audio mute (When CD – ROM game of PAC – S10 only) H : Mute
26	LED 4	O	CD LED drive output
27	ATCC	O	Switch digital filter attenuate control (Used with SEGA MUTE) H : Controled by Mechanism control L : Controled by Pack
28	A 15	O	Address line for external memory access
29	A 14	O	
30	A 13	O	
31	A 12	O	
32	A 11	O	
33	A 10	O	
34	A 9	O	
35	A 8	O	
36	AD 7	I/O	Address data line for external memory access
37	AD 6	I/O	
38	AD 5	I/O	
39	AD 4	I/O	
40	AD 3	I/O	
41	AD 2	I/O	
42	AD 1	I/O	
43	AD 0	I/O	

No.	Pin name	I/O	Function
44	ASTB	O	Address strobe line for external memory
45	Vss	–	GND
46	MODE	I	Switch external ROM / internal ROM Fixed in H(external).
47	EIO 0	I/O	Pack interface
48	EIO 1	I/O	
49	EIO 2	I/O	
50	EIO 3	I/O	
51	EIO 4	I/O	
52	EIO 5	I/O	
53	EIO 6	I/O	
54	EIO 7	I/O	

	PAC–S10	PAC–N10	PAC–K1
EIO 0	$\overline{\text{IRQ}}$	$\overline{\text{C}}$/D	KARA LED
1	CDCK	$\overline{\text{I}}$/O	KSOUT0
2	D/M	REQ	KSOUT1
3	HOCK	ACK	KSIN0
4	DBUS0	DBUS0	KSIN1
5	DBUS1	DBUS1	KSIN2
6	DBUS2	DBUS2	MICCON1
7	DBUS3	DBUS3	MICCON2

No.	Pin name	I/O	Function
55	VDD	–	Standard power supply
56	PACKDEF	I	A/D input, detect Pack type
57	EAD 1	I	A/D input, for barance VR input of PAC – K1
58	EAD 2	I	A/D input, for echo VR input of PAC – K1
59		I	Not used (L fixed)
60	KIN 0	I	MEMORY key input
61	KIN 1	I	PLAY key input
62	KIN 2	I	LD OPEN key input
63	KIN 3	I	CD OPEN key input
64	AVDD	–	Standard power supply for A/D converter
65	AVREF1	–	Reference voltage for A/D converter
66	AVss	–	GND for A/D converter
67	ANO 0	O	D/A output, PAC – K1 DSP chip select
68	ANO 1	O	D/A output
69	AVREF 2	–	Reference voltage for D/A converter
70	AVREF 3	–	
71	VSYNC	I	V – SYNC signal input for game
72	SEL IR	I	Remote control signal input
73	SHAKE	I	Communication handshake timing clock with mechanism control
74	SOFT RST	I	RESET input from pack
75	FG	I	FG input
76	EINT1	I	General interrupt input, Communication start trigger with PAC – N10, switch KARAOKE/NORMAL with PAC – K1
77	EINT2	I	General interrupt input
78	SI	I	Secial communication receive data
79	RxD	I	Serial data input with UART
80	TxD	O	Serial data output with UART

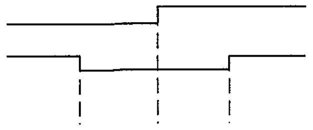
■PD0178(CONT ASSY IC201)

● Mechanism control IC

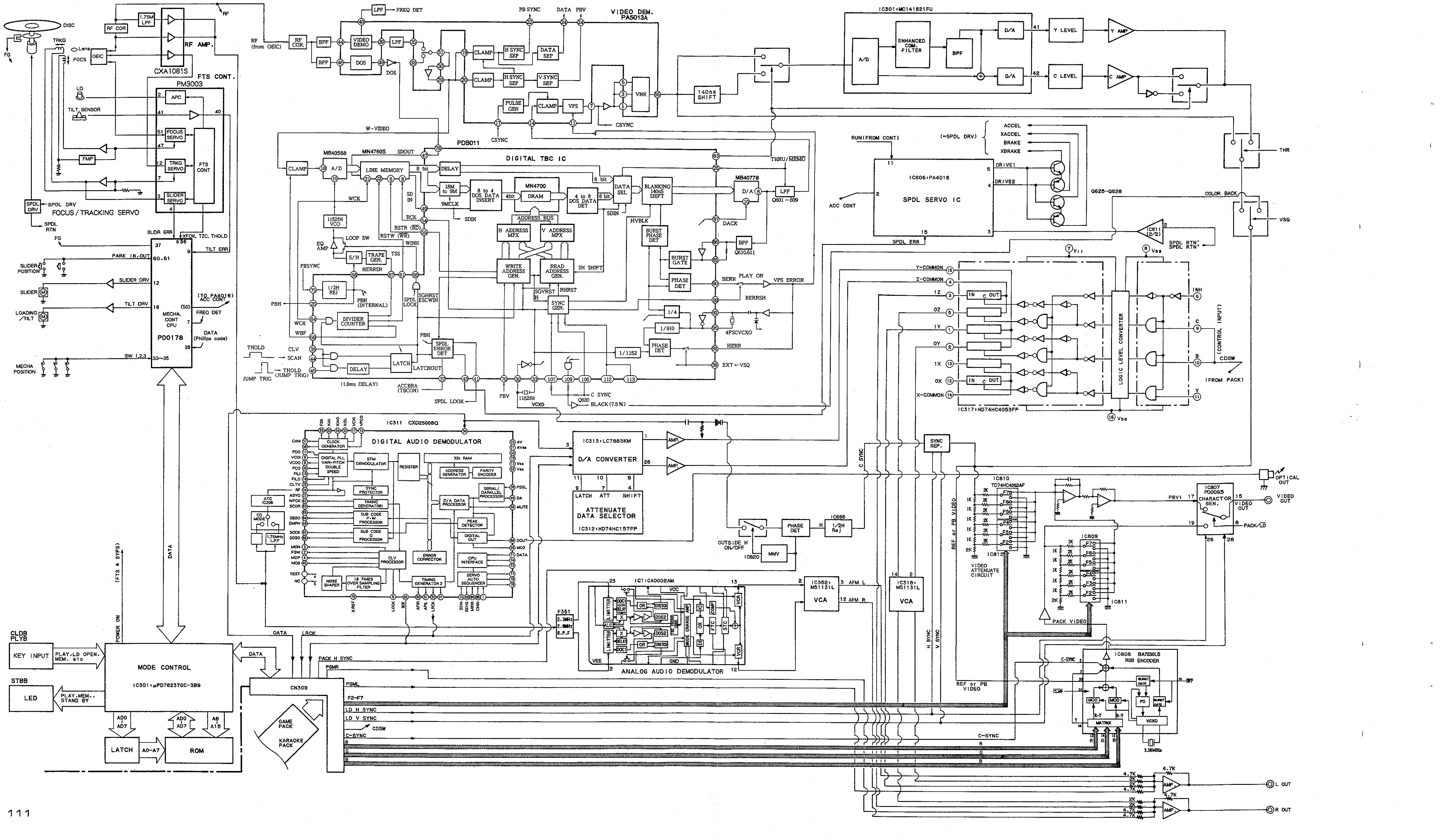
● Pin Function

No.	Pin name	I/O	Function
1	VCC	–	Power supply connection pin. Set to 5V ±10%
2	XCX	O	Analog audio CX noise reduction switching signal output pin ON : L, OFF : H
3	SQ1	O	Alalog audio switching signal output pin 1/L Squelch : H When digital audio mode, the signal is output through the control of the EFM decoder IC : CXD2500BQ.
4	SQ2	O	Alalog audio switching signal output pin 2/R Squelch : H
5	XANA	O	Digital/analog audio switching signal output pin Digital : H, Analog : L Signals output by the line out and headphone are switched by the signal.
6	TBAL ERR	I	Tracking balance error signal input pin (analog signal) Signal is A/D converted and is input as the tracking offset control.
7	FREQ DET	I	RF detection signal input pin (analog signal) Inputs the A/D conversion of the RF detection output and is used in the spindle luff servo-mechanism. Voltage and frequency are proportional.
8	SLDR ERR	I	Pickup position detection switch input pin (analog signal) Drives the resistance among the switches, reads the value of the A/D input, and detects the position.
9	TILT ERR	I	Tilt sensor output signal input pin (analog signal) Inputs (0 to 5 V) the tilt sensor output amplified to a 40 to 50 dB signal. The signal is A/D converted and is input as the tilt sensor control. Controls the tilt motor until the signal is 2.5 V.
10	MUTE	O	Audio system audio mute control output pin MUTE ON : H, MUTE OFF : L
11	THR	O	Digital memory control output pin Through : H, Memory ON : L
12	SLDR DRV	O	Slider move drive signal output pin Drive the slider by changing the duty of the signal. Cycle : 36mS, 3-value control H : FWD direction, Z : OFF, L : REV direction
13	T OFF	O	Tracking operation control signal output pin The signal backups ON/OFF of the tracking servo operation. OFF : H, ON : L
14	GFS	I	CD(EFM signal) frame lock signal input pin Connected to pin 12 of the EFM decoder IC : CXD2500BQ. Lock : H, Unlock : L GFS is an abbreviation for Good Frame Sync.
15	SI2	I	EFM decoder IC : CXD2500BQ subcode input pin Reads the subcodes of SCK2 and the signal.
16	XLAT2	O	EFM decoder IC : CXD2500BQ control latch signal output pin Sends the control command using SO3 and 2500CLK
17	SCK2	O	EFM decoder IC : CXD2500BQ subcode read clock signal output pin Sets the clock to 96 and reads the subcode.
18	TBAL DRV	O	Tracking offset control signal output pin Outputs the tracking offset after PWM and is used in auto tracking offset. Cycle : 910μsec, 3-value control H, L, Z.
19	SITOM	I	Input pin of data from mode control IC Serial Used with the data signal to the character generator IC.
20	SMTOI	O	Serial data output to the mode control IC Serial
21	SCK	I/O	Clock for serial communication with the mode control IC In the input mode except during serial communication with the mode control IC. Used with the clock signal to the character generator IC.

No.	Pin name	I/O	Function
22	TZC	I	Input pin for Tracking Zero Cross signal from IC803 (PM3003)
23	SCOR	I	Subcode SYNC signal input pin Inputs the subcode signal from the EFM decoder IC : CXD2500BQ when the signal is "H". Supervises the disc playback depending on the presence of the signal.
24	DF LATCH	O	Digital filter (LC7883) serial control latch signal output pin
25	SHAKE	I/O	Pin of handshake signal for data communication with the mode control IC This pin is a bi-directional data path which sends the data transfer timing through the I/O mode switching of the respective microcomputers.
26	XPBV	I	LD/CDV playback V − SINC signal input pin IC basically operates in synchronization (falling edge) with the signal. Setting the signal as reference in the CAV special playback mode, generates jump timing. V − SYNC on going : L
27	CN VSS	—	GND for A/D conversion
28	XRESET	I	Reset signal input pin Reset : L, Cancel reset : H This pin controled by mode control.
29	XTAL IN	I	9 MHz clock generation input pin
30	XTAL OUT	O	9 MHz clock generation output pin
31	FTS CLK	O	Clock output pin for FTS IC
32	VSS	—	GND
33	SW1	I	Loading/tilt position detection switch input pin
34	SW2	I	Loading/tilt position detection switch input pin
35	SW3	I	Loading/tilt position detection switch input pin
36	XFOK	I	Focus lock signal input pin Focus lock : L
37	FG	I	Spindle motor FG signal input pin 24 pulses per signal Devided into thirds and used inside the microcomputer
38	DATA	I	Input pin for Phillips code decoder in the mechanism controller
39	XPBH	I	Playback H − SYNC input for Phillips code decoder
40	XPBV	I	Playback V − SYNC input for Phillips code decoder
41	CAV/XCLV	O	CAV/CLV switching signal output pin CAV : H CLV : L Connected to pin 6 of PA5013A and used as a VIDEO NR switching signal.
42	XYCS	O	Y/C separation control output pin Y/C separation ON : L
43	AC CONT	O	Spindle acceleration signal output pin Acceleration : H, Deceleration : L, CD, stop and play : Z
44	TILT/LOAD DRV	O	Loading and tilt control signal output pin Output tilt drive in PWM format to control loading and tilt servo mechanism.
45	J. TRIG	O	Track jump signal output pin Used for single track jump Start of track : H, Other : L, Width of "H" : approx. 20μsec
46	SCK3	O	Serial 3 clock signal output pin Reads the rising edge H : Within 2μsec, L : Within 20μsec.
47	SO3	O	Serial 3 data signal output pin With the serial data as the common signal, divides the signals into three types of latch signals (XLAT3, XLAT2, XT LATCH). LSB first

<table>
<tr><th>No.</th><th>Pin name</th><th>I/O</th><th>Function</th></tr>
<tr><td>48</td><td>XLAT3</td><td>O</td><td>Spindle servo mechanism IC latch signal output pin</td></tr>
<tr><td>49</td><td>WEN</td><td>O</td><td>Video memory write enable signal output pin
Write enable : H, Freeze : L</td></tr>
<tr><td>50</td><td>VSQ</td><td>O</td><td>Video output switching signal output pin Squelch : H, Playback video : L</td></tr>
<tr><td>51</td><td>TBC ON</td><td>O</td><td>TBC control signal output pin During multi-track jump : H, Other : L</td></tr>
<tr><td>52</td><td>RUN</td><td>O</td><td>Spindle motor ON/OFF control signal output pin ON(RUN) : H, OFF(STOP) : L</td></tr>
<tr><td>53</td><td>XSLOCK</td><td>I</td><td>Spindle lock signal input pin Lock : L, Unlock : H</td></tr>
<tr><td>54</td><td>XLD ON</td><td>O</td><td>Laser diode ON/OFF switching signal output
OFF : H, ON : L</td></tr>
<tr><td>55</td><td>POWER SAVE</td><td>O</td><td>Spindle drive circuit power save mode control output pin with IC606 (PA4016)
Power save mode : H, Normal : L</td></tr>
<tr><td>56</td><td>8INCH</td><td>O</td><td>Disc size detection signal output pin 8 inch : H, 12 inch : L
Used for IC606 (PA4016) EQ switching.</td></tr>
<tr><td>57</td><td>CDV</td><td>O</td><td>EQ switching detect signal output pin with IC606(PA4016) CDV : H</td></tr>
<tr><td>58</td><td>SHUNT</td><td>O</td><td>CD/LD switching signal output pin CD, CDV − A : H LD, CDV − V : L</td></tr>
<tr><td>59</td><td>SIP</td><td>O</td><td>Super-inpose signal output pin Super-inpose ON : H</td></tr>
<tr><td>60</td><td>PARK IN</td><td>I</td><td rowspan="2">Slider position detect switch input pin
<table>
<tr><th>PARK IN</th><th>PARK OUT</th><th></th></tr>
<tr><td>L</td><td>L</td><td>CD active</td></tr>
<tr><td>L</td><td>H</td><td>CD INSIDE</td></tr>
<tr><td>H</td><td>L</td><td>CDV active</td></tr>
<tr><td>H</td><td>H</td><td>LD active</td></tr>
</table>
</td></tr>
<tr><td>61</td><td>PARK OUT</td><td>I</td></tr>
<tr><td>62</td><td>RFCORR</td><td>O</td><td>RF correction switching signal output pin Gain up : H
Increases gain (#8000 to #8100) within the CAV.</td></tr>
<tr><td>63</td><td>EMMOD</td><td>I</td><td>Emergency mode input signal pin Emergency mode : H
Sets forcely video memory ON mode when "H" input four seconds. Reset is tray open.</td></tr>
<tr><td>64</td><td>XOPM</td><td>O</td><td>Optical output mute output pin Mute Optical output : L</td></tr>
</table>

10. BLOCK DIAGRAM


DISC
FG
TRKG
Lens
FOCS
OEIC
RF COR
1.75M LPF
RF AMP.
CXA1081S
FTS CONT.
PM3003
LD
APC
TILT SENSOR
FOCUS SERVO
TRKG SERVO
SLIDER SERVO
FTS CONT
FMP
SPDL DRV
SPDL DRV
SPDL RTN
FOCUS / TRACKING SERVO
SLDR ERR
XFOK, TZC, THOLD
TILT ERR
PARK IN, OUT
SLIDER POSITION
SLIDER
SLIDER DRV
LOADING /TILT
TILT DRV
(TO PA4016) ACC CONT
FREQ DET
DATA (Phillips code)
MECHA. CONT CPU
PD0178
SW 1,2,3
MECHA POSITION
RF (from OEIC)
RF COR.
BPF
VIDEO DEMO
DOS
LPF
FREQ DET
PB SYNC
DATA PBV
VIDEO DEM. PA5013A
CLAMP
H SYNC SEP
V SYNC SEP
DATA SEP
PULSE GEN
VPS
VNR
CSYNC
140ns SHIFT
W-VIDEO
PDB011
MB40568
MN4760S
SDOUT
A/D
LINE MEMORY
DELAY
DIGITAL TBC IC
18M to 9M
9MCLK
8 to 4 DOS DATA INSERT
MN4700
DRAM
ADDRESS BUS
4 to 8 DOS DATA DET
DATA SEL
BLANKING 140nS SHIFT
MB40778
D/A
THRU/MEMO
Q601~609
WCK
1152fH VCO
EQ AMP
LOOP SW
S/H
TRAPE GEN.
TSS
HERRSH
RSTR (RD)
RSTW (WR)
WINH
H ADDRESS MPX
V ADDRESS MPX
WRITE ADDRESS GEN.
READ ADDRESS GEN.
2H SHIFT
SYNC GEN.
BURST PHASE DET
BURST GATE
PHASE DET
HVBLK
DACK
Q610,611
BERR
PLAY ON
VPS ERROR
BERRSH
1/4
1/910
4FSCVCXO
HERR
EXT←VSQ
1/1152
PBSYNC
1/2H REJ
PBH (INTERNAL)
PBH
SPDL LOCK
SGHRST ESCWIN
DIVIDER COUNTER
SPDL ERROR DET
LATCH
LATCHOUT
THOLD
CLV
SCAN
JUMP TRIG
(JUMP TRIG)
(1.6ms DELAY)
ACCBRA (TBCON)
SPDL LOOK
PBV
1152fH
VCXO
Q630
C SYNC
BLACK (7.5%)
IC301: MC141621FU
ENHANCED COM. FILTER
Y LEVEL
Y AMP
C LEVEL
C AMP
THR
RUN (FROM CONT)
(←SPDL DRV)
ACCEL
XACCEL
BRAKE
XBRAKE
IC606: PA4016
SPDL SERVO IC
DRIVE1
DRIVE2
ACC CONT
Q625~Q628
COLOR BACK
VSQ
SPDL ERR
IC611 (2/2)
SPDL RTN⁻
SPDL RTN⁺
Y-COMMON
Z-COMMON
X-COMMON
LOGIC LEVEL CONVERTER
IC317: HD74HC4053FP
(CONTROL INPUT)
INH
CDSW
(FROM PACK)
IC311 CXD2500BQ
DIGITAL AUDIO DEMODULATOR
CLOCK GENERATOR
DIGITAL PLL VARI-PITCH DOUBLE SPEED
EFM DEMODULATOR
REGISTER
32k RAM
ADDRESS GENERATOR
PARITY ENCODER
SYNC PROTECTOR
TIMING GENERATOR1
SERIAL/ PARALLEL PROCESSOR
D/A DATA PROCESSOR
SUB CODE P-W PROCESSOR
SUB CODE Q PROCESSOR
PEAK DETECTOR
DIGITAL OUT
CLV PROCESSOR
ERROR CORRECTOR
CPU INTERFACE
NOISE SHAPER
18 TIMES OVER SAMPLING FILTER
TIMING GENERATOR 2
SERVO AUTO SEQUENCER
ATC IC206
CD MODE
1.75MHz LPF
IC313: LC7883KM
D/A CONVERTER
AMP
LATCH ATT SHIFT
ATTENUATE DATA SELECTOR
IC312: HD74HC157FP
OPTICAL OUT
SYNC SEP.
C SYNC
IC610 TC74HC4053AF
IC612
REF or PB VIDEO
VIDEO ATTENUATE CIRCUIT
IC809
IC811
IC807 PD0093
CHARACTOR GEN.
VIDEO OUT
PBV1
PACK/LD
PACK VIDEO
PHASE DET
IC666
1/2H Rej
OUTSIDE H ON/OFF
IC620
MMV
IC1: CA0002AM
ANALOG AUDIO DEMODULATOR
LIMITTER
DELAY
DOS2
STEREO
MODE CHANGE
COMP
VCR
VCC
GND
VEE
F351
2.3MHz
2.8MHz
B.P.F
IC352: M51131L
VCA
AFM L
AFM R
IC318: M51131L
H SYNC
V SYNC
IC608 BA7230LS RGB ENCODER
C-SYNC
BURST GATE
MOD
PD
VCXO
MATRIX
R-Y
B-Y
3.58MHz
REF or PB VIDEO
CLDB
PLYB
KEY INPUT
PLAY, LD OPEN, MEM. etc
STBB
LED
PLAY, MEM., STAND BY
MODE CONTROL
IC301: μPD78237GC-3B9
POWER ON
(FTS & SYPS)
DATA
AD0~AD7
A8~A15
LATCH
A0-A7
ROM
LRCK
PACK H SYNC
PGMR
PGML
CN309
F2-F7
LD H SYNC
LD V SYNC
CDSW
GAME PACK
KARAOKE PACK
R
G
B
4.7K
2K
L OUT
R OUT

11. PANEL FACILITIES

POWER SWITCH
Press to switch the power supply ON/OFF. When installing/detaching the Control Pack, ensure that the power supply is OFF.

PLAY/STILL BUTTON
Press to perform playback of the disc. Press during performing playback of an LD or CDV disc, and the picture becomes still.

STANDBY/ON INDICATOR
Illuminates green when the power supply is switched ON by the power switch. When the power supply is switched OFF by the remote control unit, the indicator lights up red.

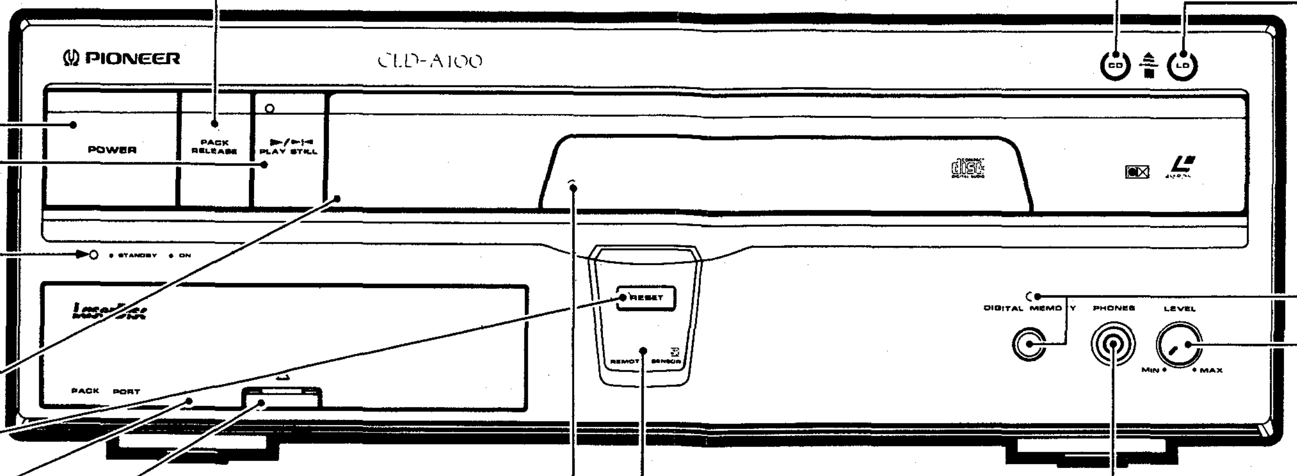
DISC TABLE

RESET BUTTON
Resets the games software when playing games software utilized by the separately sold Control Pack.

Control Pack installation slot

Control Pack installation slot cover
Attach when the Control Pack is not installed.

PACK RELEASE BUTTON
Press to release the Control Pack.



CD DISC TABLE
Exclusive use CD disc table

REMOTE CONTROL SENSOR

CD STOP OPEN/CLOSE BUTTON (⏏)
Stops disc playback and open/closes the CD disc table

HEADPHONES TERMINAL (PHONES)
Insert standard type headphones.

HEADPHONES VOLUME ADJUSTMENT KNOB (LEVEL)

LD STOP OPEN/CLOSE BUTTON (⏏)
Stops disc playback and open/closes the LD disc table

DIGITAL MEMORY button/INDICATOR
When playing a CAV or CLV disc, turning the digital memory function ON allows you to enjoy special playback functions such as still frame and multi-speed playback with no screen disturbance. If the digital memory function is OFF, it will automatically turn ON when you fast-forward, fast-reverse or activate a special playback function (except with CAV discs). When digital memory is OFF, screen disturbance may occur momentarily when an operation such as fast-forward is carried out. However, horizontal resolution is better than when digital memory is ON.

NOTES:

- *When using a special function obtained by connecting a commercially available adaptor (such as a caption adaptor), be sure to turn the digital memory function OFF. The adaptor will not function properly if digital memory is left ON.*
- *Screen disturbance may occur momentarily when an operation such as fast-forward, fast-reverse or a special playback function is carried out when digital memory is OFF. This is not a malfunction or disc defect.*
- *This player memorizes the ON/OFF condition of the digital memory function even if the power is turned off. Turn the digital memory function ON or OFF as required the next time you play a disc. The " DIGITAL MEMORY" indicator lights when digital memory is ON.*

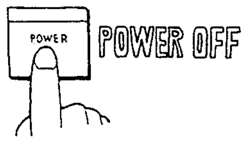
INSTALLING THE CONTROL PACK

1. **Switch OFF the power supply to the main unit.**
2. **Remove the Control Pack installation slot cover.**
   While lifting up the center of the cover with a finger nail, pull forward and detach.
3. **Insert the Control Pack into the interior of the main appliance.**
   To install accurately, lightly hold the main appliance by the top surface and carefully insert the Control Pack until the front panel is flush with the front panel of the player.

NOTES:

- *Carefully put the detached Control Pack installation cover somewhere for safekeeping, as it will be required when the Control Pack is removed from the main appliance.*
- *When the black lever protrudes in the top center of the Control Pack insertion slot and the Control Pack cannot be inserted, press in the RELEASE button.*

1



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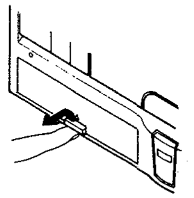

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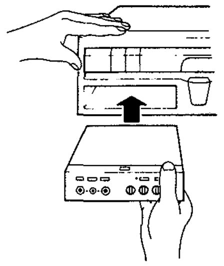
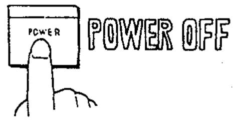


DETACHING THE CONTROL PACK

1. **Switch OFF the power supply to the main unit.**
2. **To detach the Control Pack accurately, lightly hold the main appliance by the top surface and press the RELEASE button.**
   The Control Pack is partially ejected forward.
3. **Detach the Control Pack.**
4. **Fit the Control Pack insertion slot cover.**
   First, introduce the top edge of the cover into the cover attachment slots on the main appliance, then fit the bottom edge into place.

1



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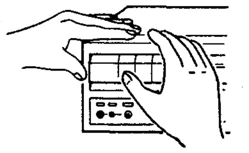

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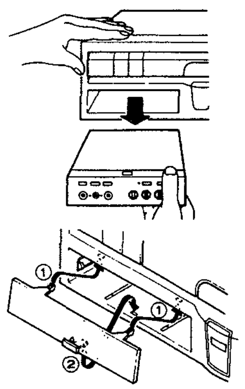

12. SPECIFICATIONS

1. General

System ······ Laser Vision Disc system and Compact Disc digital audio system
Laser ······ Semiconductor laser wavelength 780 nm
Power requirements ······ AC120 V, 60 Hz
Power consumption ······ 47W
Weight ······ 7.8 kg (17 lbs 3 oz)
Dimensions ······ 420 (W)×390.5 (D)×145 (H) mm
16-9/16 (W)×15-3/8 (D)×5-11/16 (H) in
Operating temperature ······ +5°C—+35°C (41°F—95°F)
Operating humidity ······ 5%—85%
(There should be no condensation of moisture.)

2. Disc

Laser Vision Discs

*Maximum playing times
  12-inch standard play disc ······ 1 hour/both sides
  12-inch extended play disc ······ 2 hours/both sides
  8-inch standard play disc ······ 28 min/both sides
  14 min/one side
  8-inch extended play disc ······ 40 min/both sides
  20 min/one side

Spindle motor speed
  Standard play disc ······ 1,800 rpm
  Extended play disc ······ 1,800 rpm (inner circumference) to 600 rpm (outer circumference)
  (For a 12-inch disc)

Compact Discs

DISC ······ Diameter: 5-inch, 3-inch, Thickness: 1.2 mm
Rotation direction (pickup side) ······ Counterclockwise
Linear speed ······ 1.2—1.4 m/sec
*Maximum playing time ······ 74 min. 5-inch discs
20 min. 3-inch discs
(For stereo playback)

Compact Discs with Video

Disc ······ Diameter: 5-inch, Thickness: 1.2 mm
Rotation direction (pickup side) ······ Counterclockwise
Linear speed ······ Audio portion: 1.2—1.4 m/sec
Video portion: 11—12 m/sec
*Maximum playing time ······ Video portion: 5 min. (CLV)
Audio portion: 20 min. (Digital)

**Actual playback time differs for each disc.*

3. Video characteristics (two pairs)

Format ······ NTSC specifications
Video output
  Level ······ 1 Vp-p nominal, sync. negative, terminated
  Impedance ······ 75 Ω unbalanced
  Jacks ······ Both RCA jacks

4. Audio characteristics (two pairs)

Output level
  During analog audio output ······ 200 mVrms (1 kHz, 40%)
  During digital audio output ······ 200 mVrms (1 kHz, −20 dB)
  Jacks ······ Both RCA jacks
  Number of channels ······ 2

5. Other Terminals

Control input/output ······ Both miniature jacks
Optical digital output ······ Optical digital jack
VHF ADAPTER Output ······ JA—RF3L

6. Accessories

Remote control unit (CU-CLD085) ······ 1
Size "AAA" (IEC R03) dry cell batteries ······ 2
Video cord ······ 1
Audio cord ······ 1
Operating instructions ······ 1
Warranty card ······ 1

7. Functions

Remote control operations (CU-CLD085)

	Function	Standard-play Disc (CAV)	Extended-play Disc (CLV)	Compact Disc with Video	Compact Disc
Basic Functions	Single-side play Pause Stop	YES YES YES	YES YES YES	YES YES YES	YES YES YES
Search	Fast forward (forward and reverse) Chapter/track skip Direct Chapter/track number search Frame number search Time number search	YES YES YES YES NO	YES YES YES NO YES	YES YES YES NO YES	YES YES YES NO YES
Time display	Elapsed time display Absolute time display Remaining track time display Remaining total time display Total number of selections, total time display	NO YES*1 NO YES*1 YES*1	YES NO NO YES*1 YES*1	YES NO YES*4 YES YES	YES YES YES YES YES
Others	CX system ON/OFF Auto Digital/Analog switch Audio channel selection (stereo, 1/L, 2/R)	YES*2 YES*3 YES	YES*2 YES*3 YES	NO NO YES	NO NO YES

*1 Only discs with TOC
*2 Valid for analog sound playing a disc with the CX mark.
*3 Can only be used with discs with digital sound tracks.
*4 Audio part only

PLAYER FUNCTIONS

- LaserActive compatible
- Digital Sound for LaseVision Discs
- Picture Stop Cancel Function
- Last Memory
- Digital Video Memory.

NOTE:
The specifications and design of this product are subject to change without notice, due to improvements.

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